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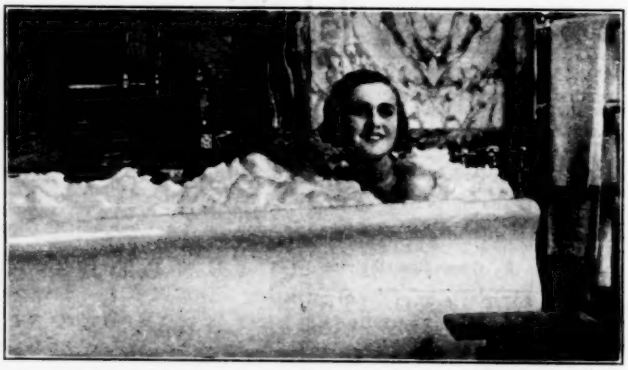

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ADDRESSES AND ORIGINAL ARTICLES

PAROXYSMAL TACHYCARDIA.

The Bradshaw Lecture delivered before the Royal College of Physicians of London on Nov. 4th, 1930,

BY W. E. HUME, C.M.G., M.A. DURH., M.D. CAMB.,

FELLOW OF THE COLLEGE; SENIOR HONORARY PHYSICIAN TO THE ROYAL VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE; LECTURER IN SYSTEMATIC MEDICINE IN THE UNIVERSITY OF DURHAM.

IN selecting paroxysmal tachycardia as my subject I have chosen a common and dramatic syndrome which has been well recognised in its chief clinical manifestations for half a century, and in which renewed interest was aroused when the electrocardiograph was introduced into clinical work about 20 years ago. This renewed interest has resulted in a clearer conception of the mechanism of a paroxysmal attack, though the prime factors of causation are even now completely obscure. The literature has become voluminous, and for the most part consists in the electrocardiographic description of isolated cases or small groups of cases, and a pause to take stock of the accumulated material is my excuse for speaking on the subject, although in a single lecture, and with a personal experience limited to a series of 50 cases, my review must be somewhat fragmentary.

In this country the credit for the first accurate description of an attack of paroxysmal tachycardia is assigned to Richard Payne Cotton,[12] physician to the Brompton Hospital for Consumption. His paper, entitled Notes and Observations upon a Case of Unusually Rapid Action of the Heart (232 per minute), appeared in the *British Medical Journal* in 1867. The patient, a tailor, aged 42, was under Cotton's observation for three years, and in one of the attacks Dr. J. Burdon Sanderson took a sphygmogram which counted the pulsations at exactly 220 per minute. The attacks of rapid heart action started and ended with great suddenness, and in Cotton's words "the action of the heart becoming suddenly in every respect natural and the pulse 80 in the minute." The publication of this case was immediately followed by the description of other similar cases by James Edmonds and by Sir Thomas Watson. On June 15th, 1867, Watson described a case in a middle-aged man "whose waggings of the heart were counted with the stethoscope at the rate of 216." The pulsations dropped suddenly to 72 when the attack ended, with the patient's exclamation, "There, I feel that I am all right again." In the fourth attack the patient died. There quickly followed reports of similar cases by Dr. Brown of Rochester, Dr. Bowles of Folkestone, and Dr. Broadbent, who described a typical case in a woman of 66 in St. Mary's Hospital. These accounts make it clear that their authors recognised the clinical syndrome which we now designate paroxysmal tachycardia. In 1882 Probsting[32] described three cases which had come under his own observation, and reviewed reports of similar cases from the literature. The first complete account of the condition was given by Bouveret[7] in 1889, and he named the disease *tachycardie paroxystique essentielle*. Little of clinical moment has been added to his exhaustive account, and on the Continent the syndrome is still often referred to as Bouveret's disease. In 1897 Herringham[32] reviewed 53 cases in the *Edinburgh Medical Journal*, together with an account of a typical example in a girl of 11 years under his care. At that time there could be no conception of the cardiac mechanism during the attacks of paroxysmal tachycardia. The teaching of James Mackenzie and the use of his ink polygraph stimulated renewed research in all forms of cardiac arhythmia, including the tachycardias, and an analysis of the cardiac mechanism was attempted. A more accurate analysis became possible with the advent of the electrocardiograph into clinical work, and the experimental and clinical researches of Engelmann, Lewis, and others eventually placed tachycardias on a physiological basis.

Electrocardiographic and experimental research has suggested that paroxysms of tachycardia may be generated at different levels in the heart—auricles, ventricles, and junctional tissues—and clearly defined types are recognised.

Types of Tachycardia.

There appear to be three rhythmic centres in the heart, each capable of generating rhythmic impulses. (1) The normal pacemaker of the heart lies in the sino-auricular node situated in the sulcus terminalis of the right auricle, dominating the other centres and sending out rhythmic impulses at the rate of 70–80 per minute. (2) A second centre lies in the auriculo-ventricular node (Tawara) and main bundle (His) of junctional tissues capable of generating impulses at a somewhat slower rate. (3) A ventricular centre which generates impulses at the rate of 30–40 beats per minute when the two higher centres are cut off from it or are in abeyance. The centre with the higher rate of impulse formation will always impose its dominance over the other centres, and though the above rates represent the natural speed of impulse formation, each centre is capable of generating impulses at an enormously higher rate. Under certain circumstances each centre may be so excitable that it becomes capable of sending out impulses at a regular and excessive speed which will then dominate the situation. This is the essence of paroxysmal tachycardia, and as each centre is capable of becoming the dominant pacemaker we can classify the tachycardias as follows:—

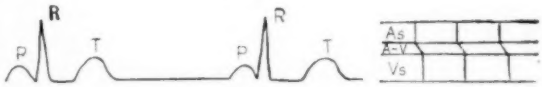
(1) Auricular:
- (*a*) Regular auricular tachycardia.
- (*b*) Auricular flutter.
- (*c*) Paroxysmal attacks of auricular fibrillation.

(2) Auriculo-ventricular (nodal):
- (*a*) Superior nodal.
- (*b*) Inferior nodal.
- (*c*) Nodal.

(3) Ventricular.

Electrically each of the above types of tachycardia has its own characteristics, and the work on the subject of paroxysmal tachycardia during the last 20 years has been chiefly the electrocardiographic study of individual cases. The result has been to show that the electrocardiographic record during an attack of paroxysmal tachycardia will usually demonstrate the level in the heart at which the abnormal rhythm is being generated (Fig. 1).

FIG. 1.

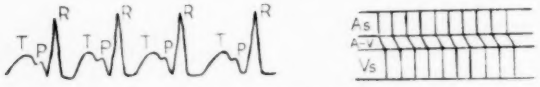


Normal.

AURICULAR TACHYCARDIA.

If the tachycardia is generated in the neighbourhood of the sino-auricular node the auricular electrical complex will have a normal appearance and P will be upright. The impulse will pass to the ventricles by the normal paths and the time of passage (P–R interval) will approximate the normal. The R wave of the ventricular complex will be sharp and characteristic of the supraventricular type (Fig. 2). If the auricular speed is very excessive—e.g., 300—the ventricles may be only able to respond to a certain

FIG. 2.



Auricular tachycardia.

proportion of the auricular impulses, and this type constitutes auricular flutter. In regular auricular tachycardia the auricular and ventricular rates are the same and vary from 140–250, and remain fairly constant in individual cases. Compression of the vagus in the neck is frequently efficacious in arresting an attack. On the other hand, in auricular flutter vagal compression may slow the ventricular speed temporarily, but this procedure has never been known to arrest an attack (Fig. 3).

FIG. 3.

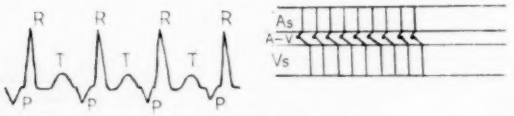
Auricular flutter.

NODAL TACHYCARDIA.

Nodal tachycardia, first described by Hering and Rihl and elaborated by Lewis,[50] with its three subdivisions, is the most common mechanism in regular paroxysmal tachycardia; the subdivision is not solely theoretical, because the varying relationship of P to R in electrocardiograms makes it apparent that the excitable centre may lie in different levels of the auriculo-ventricular node and bundle (junctional tissues).

(*a*) *Superior nodal.*—Electrically, this type is characterised by an inverted P which appears immediately anterior to R, which is sharp and of the supraventricular type. The electrocardiogram

FIG. 4.

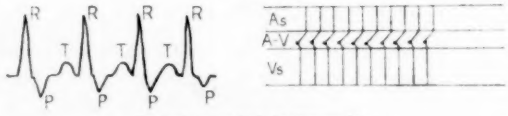


Superior nodal tachycardia.

suggests that the excitable centre lies in the upper part of the junctional tissues, and the wave of excitation, spreading towards auricles and ventricles, excites the auricles first (Fig. 4).

(*b*) *Inferior nodal.*—Conversely, P may appear immediately after R and usually notches the downstroke of R, which in its general contour is of the supraventricular type. In the inferior nodal type the electrocardiogram suggests that the excitable centre lies in the lower part of the junctional tissues and the wave of excitation, spreading towards auricles and ventricles, excites the ventricles first (Fig. 5).

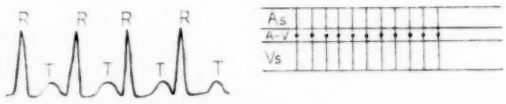
FIG. 5.



Inferior nodal tachycardia.

(*c*) *Nodal.*—If the excitable centre lies midway between auricles and ventricles and the wave of excitation passes simultaneously upwards and downwards, there will be simultaneous contraction of auricles and ventricles, with the result that P and R will coincide. In this type there is a single biphasic deflection with the characteristics of a supraventricular R (Fig. 6).

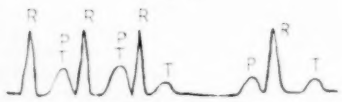
FIG. 6.



Nodal tachycardia.

Before mentioning the last variety (ventricular) it must be admitted that the classification of some electrocardiograms, characterised by a sharp biphasic R and obviously supraventricular, present difficulties in interpretation. When P falls before R in the superior nodal variety it is usually clearly defined and unmistakable. There is not, however, the same certainty in the recognition of P when it falls after R, and notches on the downward deflection of R might be variously interpreted by different observers. Similarly, when there is no evidence of P apart from R and T deflections, there is no certainty that P is buried in R—i.e., truly nodal; P may lie in the previous T denoting an auricular tachycardia. Frequently a study of the deflections at the beginning or end of a paroxysm may give the clue to the interpretation of the electrocardiogram. For instance, the form of T of the last beat of the paroxysm will show whether P has been superimposed upon it during the paroxysm (Fig. 7).

FIG. 7.



Auricular tachycardia?

However, both in those examples where P is separate and distinct and in those in which the position of P may be in doubt the R deflection is essentially of the supraventricular type and all might be classified as "supraventricular tachycardias." There seems to be evidence that the majority of electrocardiograms from cases of regular paroxysmal tachycardia present the features of a supraventricular type, and in the present state of our knowledge the more subtle subdivisions are of more academic than practical interest. For instance, there is no clinical distinction to be recognised between auricular, superior, and inferior nodal and nodal types, and no deductions can be drawn as to prognosis and treatment between a paroxysmal tachycardia of obvious auricular origin and another of obvious nodal origin.

VENTRICULAR TACHYCARDIAS.

It is otherwise, however, in the case of the last variety—ventricular tachycardia. Since Lewis, in 1909, published an electrocardiogram of ventricular tachycardia many electrocardiograms have been published which purport to show that the paroxysm has arisen in one or other ventricle. In this type the ventricular complexes have the characteristics of extrasystoles from right or left ventricle—namely, broad R and S deflections continued into a large broad T. Independent auricular deflections P can sometimes be identified amongst the ventricular deflections at a slower rate than that of the ventricles (Fig. 8).

FIG. 8.

Ventricular tachycardia.

In the interparoxysmal normal periods premature ventricular beats are apt to occur, with complexes similar to those constituting the paroxysm. Frequently it can be shown that the onset and end of the paroxysm bear the same relation to the slow rate as do the premature extrasystoles to the normal beats. There is also often a slight irregularity in the paroxysmal rate. This type of tachycardia is more frequently associated with the severer forms of heart disease and more especially with thrombosis of the coronary arteries. In 65 cases collected by Strauss[77] there was clear evidence of heart disease in 53, including 12 cases of coronary thrombosis.

Many of the recorded cases of ventricular tachycardia have had large and continued doses of digitalis, and it has been suggested that ventricular tachycardia is a toxic manifestation of digitalis in the presence of organic heart disease.

Though rare, apart from its association with gross organic heart disease, ventricular tachycardia has been described in the young and in those without any obvious heart disease, but these exceptions are scanty.[47 73] As in the case of some electrocardiograms indicative of supraventricular tachycardia there may be some uncertainty in the interpretation of apparent ventricular electrocardiograms. Certain curious electrocardiograms show bidirectional alternation of ventricular complexes[61 72] suggesting that foci in both ventricles alternately send out rhythmic impulses. These occurred in 18 out of 64 cases quoted by Strauss.[77] This appearance, however, may be otherwise explained, by presuming that the right and left branches of the bundle of His are alternately refractory and that supraventricular impulses travel alternately down one or other branch. Whatever the explanation for the bizarre appearances this type of electrocardiogram also occurs in the subjects of gross organic heart disease.

In spite of the limitations of electrocardiographic analysis the large majority of electrocardiograms from cases of regular paroxysmal tachycardia can be placed in the categories of either supraventricular or ventricular types, and we must now consider their relative frequency and the clinical facts and associations common to both varieties or peculiar to each type.

Though it is the rule that the type of paroxysm always remains constant to the individual patient there are examples of mixed types. For instance, Crawford[13] has described attacks in a medical student, aged 25 years, where during the attack the exciting centre seemed to shift from the sino-auricular node, with a rate of 181, to the auriculo-ventricular node, with a rate of 175. Barker[3] has described a case of auricular paroxysmal tachycardia which was interrupted by an attack of ventricular tachycardia; and other combinations have been described.[17 33]

During an attack of supraventricular tachycardia partial heart-block or a bundle branch block may become evident in the electrocardiogram and upset a previously regular rhythm.

In spite of these and similar irregularities the type usually remains constant to the individual, and in the supraventricular varieties the same type of attack is continued year after year. I have electrocardiograms of some patients taken over 15 years, and the records from year to year are essentially identical. In a single lecture some limitation must be placed upon the range of tachycardias to be surveyed, and I propose to deal chiefly with those regular supraventricular tachycardias which are repeated in patients year after year. Paroxysms of auricular fibrillation and auricular flutter will only be mentioned in as far as they confuse diagnosis or differ in treatment.

Paroxysmal and permanent auricular flutter was fully described by Parkinson and Bedford[62] in 1927, and both have considerable affinities with auricular fibrillation, in itself a very large subject.

INCIDENCE OF THE TYPES.

From the inherent nature of the syndrome and its irregular appearance it is only possible to obtain electrocardiographic records in a small proportion of our cases of regular paroxysmal tachycardia, and I have electrocardiographic records of 24 patients, though I have full notes of 50 cases, most of whom I have seen in attacks, and I have encountered other undoubted examples of which I have only a recollection and nothing in writing. Table I. shows the incidence in the various groups, and it is apparent that the largest incidence falls in the supraventricular type.

TABLE I.

—	Auricular.	Sup. nodal.	Inf. nodal.	Nodal.	Indeterminate but supraventric.	Ventric.	Total.
Cowan ..	1	—	—	14	—	—	15
Hume ..	1	1	1	18	1	2	24
Gallavardin (1930) ..	5	2	14	—	5	1	27
Willius and Barnes..	7	5	3	28	—	6	49
Ritchie*	26	—	—	40	26	46	138
	40	8	18	100	32	55	253

* 1926 collected.

Supraventricular .. .. 198 = 78·3 per cent.
Ventricular .. .. .. 55 = 21·7 „ „

The figure 55 representing the ventricular type of paroxysms is probably excessive and requires comment. It includes examples of short runs of ventricular tachycardia which have been described as salvoes of extrasystoles—in one case a run of 8 beats and in another a run of 13 beats.[69] These have been found on systematic electrocardiographic examination of the heart in patients suffering from gross organic heart disease. In some instances again the ventricular paroxysm was a terminal event, as four-fifths of 50 cases with ventricular tachycardia described by Strauss died within periods varying

from three hours to six months after the onset of ventricular tachycardia, with an average of 24 days. For these reasons it is thought that the proportion of ventricular to supraventricular tachycardia is exaggerated in the table and cannot amount to more than 20 per cent. of all forms of paroxysmal tachycardia. In those who are subject to attacks of paroxysmal tachycardia extending over years a supraventricular type will usually be demonstrated by the electrocardiograph, in which the nodal type predominates.

General Symptomatology.

The attack.—It is unnecessary to dwell at any length on those well-known characteristics of paroxysmal attack which are common to all varieties of paroxysmal tachycardia, at whatever site the paroxysm is generated. The abrupt onset and the equally abrupt termination of the attack distinguish this syndrome from any other form of palpitation.

Prodromal symptoms are usually conspicuously absent, and the patient is taken completely unawares. Gallavardin and Froment [24] quote the case of a man, aged 48, who for two days before an attack had an exceptional feeling of well-being, and a woman of 52 years who was warned by an exceptional thirst. In another woman the attack appeared within the three days preceding the onset of menstruation, in whom when pregnant the attacks continued to appear each month at similar dates. Prodromal warnings have not occurred in any of my patients.

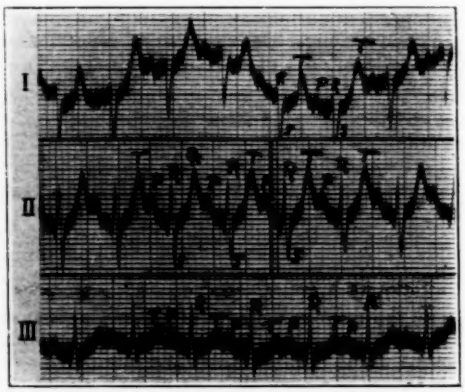
Exciting cause of the attacks.—In most patients the attack sets in without warning and without a definite exciting cause, sometimes even during complete relaxation and rest. In a few there are exciting causes which the patient learns to avoid; prolonged physical effort, such as playing football, would with certainty produce an attack in one of my patients, and in another quick walking after a heavy meal would invariably produce an attack. The bending movement required to put on shoes is particularly prone to produce a paroxysm, and nearly all patients avoid this by standing and putting a foot on a chair. In one of my patients who has only had four attacks in four years the attack seemed to be induced on two out of the four occasions by the enforced holding of the breathing during the excessive effervescence of a Seidlitz powder. In some nervous patients the original first attack of paroxysmal tachycardia may have had an unusual emotional cause; for instance, one patient was terrified by the bursting of a thunderbolt within a few yards of her and the heart immediately broke into a first attack of tachycardia; a boy caught stealing apples and a girl frightened by a dog jumping at her throat were both suddenly seized with their first attacks, to be repeated without apparent cause through the years to come. Goodman and de Graff [28] quote a curious case of a girl, aged 13, with advanced rheumatic heart disease in whom pressure over the heart caused a sudden quickening of the ventricular rate to 170, while the auricles continued to beat at 80 per minute.

Observations During an Attack.

When an attack is launched various observations may be made on the patient's general condition, and on the condition and behaviour of individual organs and systems.

The rate of the heart is of interest in all cases. In all forms of tachycardia the ventricular speed usually lies between 150 and 260, figures below and above these limits being comparatively few. A regular ventricular speed in the neighbourhood of 180–200 would always suggest a regular tachycardia of abnormal supraventricular or ventricular origin. Prolonged and regular ventricular rates of approximately 150 are compatible with a 2 : 1 auricular flutter, indicating an auricular speed of 300. The rate during an individual attack of paroxysmal tachycardia remains fairly constant during that attack. At the instigation of Lewis, Feil and Gilder [20] found that the variation was less than 0·01 second in eight cases of various regular tachycardias, though slight differences, such as 180–184 and 204–210, are frequent. In prolonged seizures there may be greater variation in speed. Marvin [55] noted the gradual slowing of rate from 172 to 124 during five days, and Ritchie [69] noted that a rate of 190 fell to 120 a few hours before death without any change in the tachycardic mechanism. The last observer found in one patient that the rate was quicker when the patient was lying down (228) than when standing up (214). Excessive rates are rare; Langley [40] quotes the case of a boy of 14 years whose ventricular rate was 300.

Electrocardiogram I.



Auricular tachycardia. Rate = ca 165.

The heart.—It is primarily important to ascertain if there is any evidence of organic disease of the heart and the cardiovascular system, and a final opinon may be impossible during the attack. It may be convenient at this stage to assess the incidence of organic heart disease in those subject to attacks of paroxysmal tachycardia. Gallavardin and Froment,[24] analysing 177 cases of supraventricular tachycardia, came to the conclusion that there was no evidence of organic cardiovascular disease in 110; in other words, that the examination of the cardiovascular system both during attacks and in normal periods was completely negative in nearly two-thirds of their cases. From a study of the literature it must be confessed that a true estimate of the incidence of organic cardiovascular disease is not always easy. It is often difficult to be certain of the exact type of paroxysmal attack contained in the analysis, and it is essential to separate the supraventricular from the ventricular types, as the latter are much more closely associated with organic heart disease than are the supraventricular types. Other authors put the proportion of organic cases at a lower figure; Hoffmann, Huchard, Chauffard, Mecklen, and Vaquez (quoted by Gallavardin and Froment) estimate that only one-fifth of all cases have organic disease. My own figures show that in patients, whom for the most

part I have been able to follow for many years, there was no evidence of cardiovascular disease in 30 out of a total of 48 with supraventricular tachycardias. Table II. shows the type of cardiovascular disease associated with supraventricular tachycardia.

TABLE II.

Own Cases.			*Gallavardin and Froment.*		
Rheumatic valvular disease	1		Valvular lesions	27	
Syphilitic aortitis	2		Hypertensive cases	34	
Diphtheria (acute)	1		Various heart lesions	6	
Diphtheria (sequel)	1			67	% (37·8)
Arterio-sclerosis	6				
Myocardial degeneration	7				
	18	% (37·5)			
No cardiovascular lesion	30	(62·5)	No cardiovascular lesion	110	(62·2)
	48			177	

It is very different, however, when inquiry is made into the incidence of organic heart disease in patients who are subject to attacks of ventricular tachycardia. Strauss[77] has analysed the histories and cardiovascular states of 64 patients who were subject to attacks of ventricular tachycardia and in only 11 was there *no* evidence of cardiovascular pathology. Table III. shows the varieties of cardiovascular disease discovered in 53 out of 64 patients:—

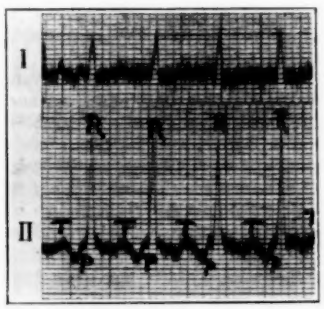
TABLE III.

Cardiovascular hypertensive disease	16
Coronary disease	12
Rheumatic heart disease	8
Arterio-sclerotic heart disease	4
Syphilitic heart disease	4
Thyrotoxic	2
Type of heart disease not clear	7
	53

It seems to be a fair deduction from these tables that no evidence of cardiovascular disease will be found in two-thirds of patients with supraventricular tachycardia and that cardiovascular disease *will* be found in four-fifths of patients with ventricular tachycardia. Certain observations have been made on the *alteration in size of the heart* during the attack. Wenkebach observed that there was no dilatation, whilst Vaughan (quoted by Miller, Smith, and Graber[57]) estimated an increase of 1 cm. and Wilson [84] an increase of 2·5 cm. during attacks observed by them. Stewart and Crawford[76] studied the effect of regular and irregular tachycardias on the size of the heart by means of the X ray shadow. The experiments were conducted on normal anæsthetised dogs and they came to the following conclusions: (1) during regular tachycardias there was a decrease in the size of the heart; (2) that in auricular fibrillation the size was unchanged or increased.

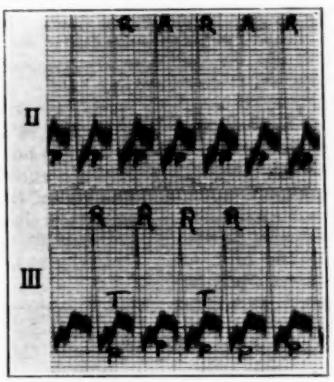
When attacks are prolonged up to four and five days there is often gross clinical evidence that the apex has moved outwards, and this is especially likely to occur in those patients with accompanying organic lesions. In a patient of my own, a boy of 17 years, who had fibrous myocarditis (post mortem) after an attack had lasted three days the apex moved outwards and there were obvious signs of congestive failure in the lungs with oliguria. The appearance of these signs is very uncertain and an attack may last for several weeks without the appearance of any sign of congestive failure, and in this respect much depends on the presence or absence of organic heart disease. It has often been noted that organic heart murmurs present in normal intervals disappear during an attack of tachycardia.

Electrocardiogram 2.



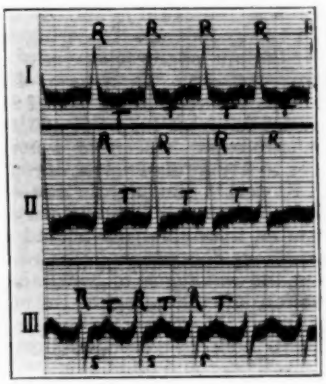
Superior nodal tachycardia. Rate = 187.

Electrocardiogram 3.



Inferior nodal tachycardia. Rate = 200.

Electrocardiogram 4.



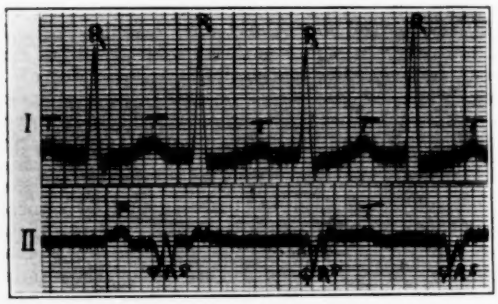
Nodal tachycardia. Rate = ca 170.

Pain of an anginal character occurs infrequently. Willius and Barnes [5] recorded severe chest pain in 5 per cent. of 380 cases and Gallavardin and Froment [24] in one-seventeenth of 177 cases. In many the pain did not occur until the later attacks in a patient's life and usually after an attack had lasted many hours. In one of my patients it occurred after an attack had lasted five hours and that attack had been preceded by a particularly fatiguing and anxious day. It required morphia for its relief, which brought about sleep, and when the patient awoke the attack had ended. In my private patients chest sensations, varying from oppression to actual chest pain, with pain or numbness in the arms, is more common than in hospital patients and there were definite chest discomforts in 16 per cent.

Blood Pressure.—(*a*) Arterial pressure usually falls during an attack. A pressure varying between 165/100 and 190/115 in the inter-paroxysmal period fell to 130/95 during an attack (Hirschfelder, quoted by Miller, Smith, and Graber [57]) and in another patient there was a fall from 190/115 to 95/85 during an attack with a ventricular rate of 200 (Willius, quoted by Miller, Smith, and Graber [57]). There seem to be several causes for the fall of arterial blood pressure: (1) The shortened diastole causes a diminished systolic

output; (2) the contractile power of the ventricles is lessened by the shortened diastole; (3) the simultaneous contraction of auricles and ventricles in nodal tachycardia would tend to diminish the output from the ventricles. On rare occasions the blood pressure

Electrocardiogram 5.



Nodal tachycardia. Lead I. shows the paroxysm. In lead II. the first complex shows normal rhythm, the other two the onset of a paroxysm; the Q R S complexes are common to both. Rate = ca 187.

rises and Gallavardin and Froment[24] quote a rise from 120 to 160 mm. Hg during an attack.

(*b*) Certain observations have been made on the venous pressure. In a case of paroxysmal tachycardia with a ventricular rate of 220 the arterial blood pressure fell from 135/85 to 120/110 mm. Hg, and the venous pressure rose from a normal of 105 mm. of water to 210 mm. of water during an attack (Hooker and Eyster).[34] Similarly, in a case quoted by Kroetz[39] in which there was a heart rate of 220 with cyanosis, dyspnœa, liver enlargement and albuminuria, during the attacks the venous pressure rose to 160 mm. of water and was found to be 50 mm. of water after the cessation of the attack. In paroxysmal auricular fibrillation the venous pressure rose from 80–90 mm. of water and the ventricular rate increased from 84 to 108 (Eyster and Middleton).[19] Eyster[18] concludes, "that venous pressure may or may not rise in paroxysmal tachycardia and paroxysmal auricular fibrillation depending upon whether or not cardiac incompetence supervenes."

Blood gases.—Barcroft, Bock, and Roughton[2] have summarised the changes in the blood gases as follows: (1) there is a marked decrease of arterial oxygen saturation without demonstrable pulmonary congestion; (2) there is a low CO_2 content of arterial blood during the paroxysm; (3) there is a very low oxygen saturation of venous blood, part of which they attributed to anoxic anoxæmia due to slowing of the circulation; (4) there was a greatly increased coefficient of utilisation during the paroxysm indicating a very slow circulation-rate; (5) there is a decrease in vital capacity immediately following the paroxysm.

The patient's tolerance of the attack varies a good deal and the varying degrees of discomfort experienced by different patients is inexplicable. I have gone into the question with 34 of my patients who have been under observation for many years and the degrees of discomfort and distress in each attack are very constant to the individual. The results may be summarised as follows:—

Severe (prostration)	11
Moderately severe (necessitating recumbency) ..	15
Trivial (able to go about)	8
	34

Though most patients prefer to rest, and to sit rather than to lie, there are those who can move about quite freely. One of my patients, at the age of 60 years, who had suffered from attacks for 25 years, was able to walk up one of the steepest banks of our district in the full flood of an attack. The commonest complaints are of giddiness, faintness, exhaustion, and in some absolute prostration. The rapid and violent beating of the heart distresses the patient considerably and after the attack there is usually a feeling of exhaustion.

Occasionally *nervous symptoms* may be dominant and Barnes[4] quotes 15 cases, of whom ten were males, where the nervous manifestations were prominent, and Table IV. shows the type of nervous derangement:—

TABLE IV.

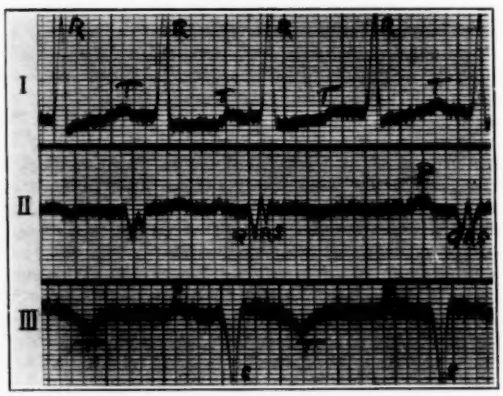
Vertigo	8
Temporary blindness	6
Falling but no loss of consciousness	5
Syncopal attacks	4
Epileptiform seizures	2

These symptoms were interchangeable amongst the 15 patients. Ritchie[69] states that nervous symptoms were marked in 15 out of 104 cases. Wilson[84] quotes the case of a man aged 38 years subject to attacks of auricular paroxysmal tachycardia which would sometimes last eight days, in whom during different attacks there occurred aphasia, hemiplegia, epileptiform attacks, and gangrene of the left arm necessitating amputation below the shoulder-joint.

Some would seem to suggest that paroxysmal tachycardia is an allergic disease and claim to see a relationship between it and asthma and migraine.[42 79] I have not encountered any such associations.

The *actual termination* of the paroxysmal attack is abrupt, but before the complete restoration of the

Electrocardiogram 6.



Nodal tachycardia. Lead I. shows the paroxysm, which ceases at the last complex of lead II. Lead III. is the normal rhythm. Rate = ca 160.

normal rhythm there may be some irregularities, and the following are the chief mechanical modes of ending:—

(*a*) Abrupt transition from the attack to the normal rhythm.

(*b*) The last beat of the paroxysm is followed by the appearance of ventricular extrasystoles, either singly or in salvoes.

(*c*) The last beat is followed by a series of slow pulsations with a negative P in the electrocardiogram.

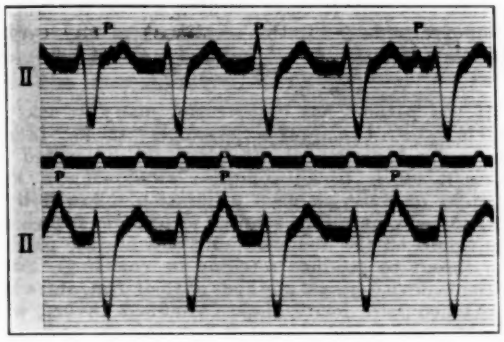
(*d*) A slow nodal rhythm succeeds the paroxysm for a few seconds. After the paroxysm the normal rate is usually

somewhat quickened before it settles down to the normal for the individual. The method of termination is not always constant in the same patient.[24]

Frequency and Duration of Attacks.

There is the greatest variation in the frequency with which patients are liable to have attacks. I have come across undoubted examples of a single attack

Electrocardiogram 7.



Ventricular tachycardia. Rate = ca 150.
(Dr. John Parkinson's case.)

in a lifetime. I saw such an attack in a child 21 years ago who has never had a second attack. When members of our profession describe in their own persons a typical attack, with abrupt onset and offset, there can be no question of wrong diagnosis, and I have come across two instances of single attacks in doctors. If an individual experiences a single attack and there is no recurrence he assumes it to be an unusual palpitation, and if it never recurs he does not seek medical advice and may never mention to anyone his soon forgotten experience.

In those subject to repeated attacks the frequency varies greatly. At first the intervals between attacks may be long, and later in life they may become much shortened. A man of 70 years had 34 paroxysms in 87 days lasting from 8 to 14 hours and then only had three attacks in five months (Corney). One of my patients since 1922 has had about 100 attacks each year. Many have had frequent attacks over a period of two to three years and then have had long intervals with few attacks, and I have been unable to find any explanation for the variation. The frequency of attacks is often in inverse ratio to the length of the attacks, and the longer the preceding attack has been the longer will the patient wait for the next attack. There is no doubt also that the liability to attacks may completely disappear. In two of my patients there have been no attacks for seven to eight years although they had been frequent in the previous four years.

The *liability to attacks* may extend over the whole of a lifetime and one of my patients has had infrequent attacks for 52 years, though the average duration in 32 of my cases was 15½ years. The repeated attacks impose no lasting disability on the heart and my patient, a busy doctor, subject to attacks for 52 years, has to-day a cardiovascular system perfectly normal for his years. Cowan tells me of a patient under his care for many years, who was subject to attacks from the age of 18 years to his death at the age of 75—57 years—who was a busy member of the legal profession, reached the Bench, and made speeches in the House of Commons in the full flood of a paroxysm.

The length of individual attacks also shows great variation, but the vast majority are of less than 12 hours' duration (Table V.).

TABLE V.—*Showing the Longest Attacks to which Patient was subject.*

	Gallavardin and Froment.	Own cases.
Less than 12 hours ..	113	36
12–24 hours..	27	8
24–48 hours	16	2
2–5 days	6	0
5–10 days	4	1
10 days–1 month	7	1
1 month–2 months ..	3	0
Up to one year	1	0
	177	48

Scattered through the literature attacks of exceptional length can be found—namely, 15 months (Ritchie).[69] Rarely do attacks last for more than ten days. In 160 cases quoted by Gallavardin, Veil, and Froment, 11 had attacks lasting more than ten days. Seven had attacks lasting from ten days to one month, and in four there were paroxysms lasting from 1 to 12 months. In some of the prolonged attacks it is difficult to be certain that there are not temporary cessations, and in a woman with organic heart disease whom I saw in her home the attack was said to have lasted eight months, but during my visit I detected three short pauses and it is probable that throughout the eight months temporary breaks occurred, without the patient's knowledge and unnoticed by her attendants. She died with congestive failure a month later without noticeable cessation of the paroxysm. (Not included in above Table.)

Sex.—The incidence in the sexes is almost equal—the proportion being given by Gallavardin and Froment[24] as 82 men to 95 women, and by Willius and Barnes[5] as 59 men to 51 women, which is probably the correct relationship, though my own figures show 34 males to 16 females.

Age.—The average age at which the attacks *started* was 36 years in 34 of my patients, in whom the date could be accurately determined, the youngest being six years and the oldest 73 years (nodal type). Table VI. sets out the ages at *onset* in decades.

TABLE VI.

10–20 years	8	60–70 years ..	5
20–30 ,, ...	7	70–80 ,, ...	1
30–40 ,, ...	4		
40–50 ,, ...	5		34
50–60 ,, ...	4		

Though the youngest patient in my series was 6 years old, attacks of paroxysmal tachycardia have been described from infancy onwards. The earliest record I can find was that described by Werley[82] in an infant 4 days old who developed a ventricular rate of 307. The attack passed off in a few hours. This was succeeded by another attack with a ventricular rate of 300 and respiration rate of 70, and the child was very cyanosed. The infant died on the sixth day and the only cardiac abnormality was a widely dilated foramen ovale (7 mm.). Attacks have been described at the age of 15 months (Russell and Ellison),[71] 27 months (Dressler and Levy),[16] and 32 months (Hutchison and Parkinson).[36] As I have already mentioned, it is extremely probable that unique attacks may occur in adults and isolated attacks may be completely overlooked in the young.

Ætiology.—It has been mentioned that the prime factors of causation of an attack of paroxysmal

tachycardia are still obscure, and the diversity of circumstances in which attacks appear makes this unsatisfactory admission quite comprehensible.

Heredity plays little part in most cases. Attacks have been described in four generations, and two of my patients are sisters—one with arterio-sclerosis and a blood pressure of 200 for ten years—and the other with a normal cardiovascular system. Infectious diseases, thyroid and ovarian derangements have been invoked but without any weight of evidence. Hypothetic nerve influences through the vagus and sympathetic nerves and actual involvement of these nerves by cervical and mediastinal tumours have been cited but do not convince. Morbid anatomy has failed to demonstrate any pathological lesion in the heart musculature, and none would be expected in a condition lasting so many years without any other evidence of cardiac involvement.

Diagnosis.

If an electrocardiogram is obtainable during a paroxysm, with some exceptions, a diagnosis of the exact type of tachycardia can be made. A *regular* tachycardia will conform to the electrical characteristics of a regular auricular flutter—e.g., 2 : 1—a supraventricular or a ventricular tachycardia. Secondly, the patient may be seen in an attack but there may be no opportunity of obtaining an electrical record. Without this assistance can a diagnosis be hazarded as to the particular type of tachycardia?

(*a*) If the ventricular rhythm is very *rapid and irregular* the probability lies between paroxysmal auricular fibrillation and auricular flutter. When the ventricles keep changing their response to the auricular stimulus in auricular flutter the irregularity determined by the stethoscope may be very complete and simulate fibrillation of the auricles. In auricular flutter, however, there are frequently periods when the ventricular rhythm is quite regular, as it is if the response is 1 : 1 or 2 : 1, so that long runs of regular ventricular contractions appearing from time to time interspersed amongst periods of irregularity would suggest auricular flutter. After all, the distinction is not so very important, as treatment by digitalis is indicated in both conditions. Vagal pressure in the neck will usually temporarily arrest or slow the ventricular rate in both paroxysmal fibrillation and flutter, but will not stop the attack.

(*b*) If the ventricular rhythm is very rapid and *regular* we have then to differentiate between a regular auricular flutter—e.g., 2 : 1 flutter, a supraventricular tachycardia, and a ventricular tachycardia. Again, vagal pressure may assist in the differentiation. If the attack is arrested then it is certain that the attack is supraventricular, vagal pressure having no influence on ventricular tachycardia and merely temporarily arrests or slows the ventricular speed in auricular flutter. If there is no response to vagal pressure—not even temporary arrest or slowing of the ventricles (auricular flutter)—the alternatives are supraventricular or ventricular tachycardia. If the patient is under 40 years of age, has been previously subject to attacks, and has no obvious cardiovascular disease, the enormous probability is that he is subject to attacks of supraventricular origin. If, on the other hand, he is over 40, and more probably between 50 and 60 years of age, if there is cardiovascular disease and the patient has only recently become subject to attacks, the paroxysm *may* be ventricular, though it is possible that the attack is supraventricular in origin. When only a history can be obtained and there is no opportunity of witnessing an attack the diagnosis of paroxysmal tachycardia may be obvious, but a surmise of its origin must be very speculative. The patient or an attendant may know whether the heart beats quite regularly in the attack and this fact, together with the other general considerations of age, the presence or absence of cardiovascular disease, and the length of time the attacks have lasted will all help to suggest the type.

Therapeutics.

The treatment may be considered from three points of view: (1) the arrest of the attack; (2) the prevention of attacks; (3) the treatment of any cardiovascular disease.

ARREST OF AN ATTACK.

If the patient has experienced many attacks he will have learnt to apply some simple "tricks" taught either by his medical attendant or discovered by himself. Such tricks comprise swallowing a long draught of water, a deep inspiration followed by a long forced expiration, bending forwards and pressing the thighs on the abdomen, and tickling the back of the throat to produce retching or vomiting. Some patients devise special methods of their own, and a boy with rheumatic heart disease confined to bed with heart failure would get out of bed after the onset of a paroxysm, would stand motionless with his back to the edge of the bed, hold his breath as long as he could, and when he could hold it no longer he violently threw himself backwards on to the bed. I saw him arrest many attacks in this way. The production of vomiting by emetics such as apomorphine has been advocated by some, but is not to be recommended if retching after tickling the throat does not arrest the attack. The vomiting produced by ipecacuanha and apomorphine may, in my own experience, cause great prostration and never brought an attack to an end.

The earlier in the attack that these various procedures are tried the more likely they are to be efficacious. If they have failed the next step is to compress the vagus in the neck. Theoretically, the right, supplying the sino-auricular nodal region, ought to be more effective than the left, but I usually employ the left and if left vagal pressure has failed I have never succeeded with the right. Some paroxysms of supraventricular tachycardia are immediately arrested, and though no statistics are available Gallavardin and Froment[24] claim that nearly one-half of supraventricular paroxysms may be arrested by vagal pressure. My own experience more nearly approaches success in one-sixth. Some paroxysms are arrested and the rhythm remains normal from 10 to 15 minutes, but the attack recommences and further vagal pressure is ineffective. Vagal pressure also is more effective early in the attack. I have two patients who have learnt to compress their own left vagus, and they always succeed in arresting a paroxysm by this means. Whether vagal compression succeeds by direct stimulation of the vagus nerve or by stimulation of the nerve of Hering, arising in the carotid sinus and reaching the medulla by the glossopharyngeal nerve, is an interesting physiological question. If vagal compression fails, ocular pressure with the thumb and index finger on the eyeballs may be essayed. This manœuvre succeeded in one case where vagal compression had failed. I have had no experience of the injection of ouabaine, physostigmine,[24] digitalis,[86] and choline, which have been recommended after apparent individual successes.

The above measures are applicable to paroxysms

with a supraventricular origin. In ventricular tachycardia quinidine sulphate has been advocated, and with some success. Levine and Fulton [47] recommend an initial dose of 0·3 g., raising the dose every four hours by 0·1 to 0·2 g. In one case they gave 1·5 g. five times in 24 hours, and in eight cases out of ten quinidine sulphate caused a return to a normal rhythm. Eight out of ten cases had coronary thrombosis and seven died, though the paroxysms were arrested. Ventricular tachycardia is a serious addition to the heart failure of coronary thrombosis but the ultimate prognosis depends on the degree of coronary blocking rather than on the added disability of ventricular tachycardia.

The lines of most effective treatment can be summarised. In supraventricular tachycardia after the various "tricks" have failed, vagal compression is successful in a definite proportion of cases, and no other remedies have been proved to be of general applicability. In ventricular tachycardia quinidine sulphate is immediately necessary, as the procedures effective in supraventricular tachycardia are quite ineffective.

PREVENTION OF ATTACKS.

Many patients know by experience that certain circumstances, such as peculiar movements, indigestion, and emotional causes, precipitate attacks and endeavour to avoid them. The frequency of attacks of paroxysmal tachycardia varies so much naturally that it is difficult to gauge the success of any line of treatment in the prevention of their recurrence. I have some evidence that quinidine sulphate in daily doses of grs. 6 diminishes the number when these have been excessive for a long period. For example, one man who had for three years experienced about a 100 annually had only about 30 each year after he took quinidine grs. 6 daily.

The treatment of any underlying cardiovascular disease is outside the scope of this inquiry and would necessarily embrace the whole range of cardiovascular disease.

CONCLUSION.

In conclusion, attacks of paroxysmal tachycardia are a common disability, occurring most frequently in those who are free from any suspicion of cardiovascular disease, but also in association with various forms of heart disease. In neither class have we any reasonable explanation of its appearance. The exciting focus is most commonly in the junctional tissues above the ventricles, and supraventricular tachycardia may harass an individual throughout a lifetime. Ventricular tachycardia is rare except as a terminal event in gross organic heart disease, which is usually fatal within a few months. Electrocardiographic and experimental research has given us a greater insight into the cardiac mechanism of paroxysmal tachycardia and the accumulated clinical experience allows us to speak with greater assurance as to prognosis and treatment.

BIBLIOGRAPHY.

1. Alessandrini: Arch. Ital. di Chir., 1927, xviii., 158.
2. Barcroft, Bock, and Roughton: Heart, 1921, ix., 7.
3. Barker: Ibid., 1924, xi., 67.
4. Barnes: Amer. Jour. Med. Sci., 1926, clxxi., 489.
5. ,, and Willius: Boston Med. and Surg. Jour., 1924 exci., 666; Amer. Heart Jour., 1927, ii., 490.
6. Barnes and Yater: Med. Clin. North America, 1929, xii., 1603.
7. Bouveret: Rev. de Méd., 1889, ix., 753 and 837.
8. Bulirich: Semana Méd., 1926, ii., 313; Jour. Amer. Med. Assoc., 1926, lxxxvii., 1871.
9. Carter and Stewart: Arch. Int. Med., 1923, xxxi., 390.
10. Christensen: Ugesk. f. Laeger, 1928, xc., 186.
11. Corney: THE LANCET, 1922, ii., 863.
12. Cotton: Brit. Med. Jour., 1867, i., 629.
13. Crawford: Amer. Heart Jour., 1928, iii., 3, 319.
14. Dietlen: Herz und gefassen in Rontgengebild, Leipzig, 1923, p. 315.
15. Doxiades: Klin. Woch., 1930, ix., 454.
16. Dressler and Levy: Med. Klin., 1926, xxii., 1481.
17. Drury: Heart, 1924, ii., 405.
18. Eyster: Physiol. Rev., 1926, vi., 301.
19. ,, and Middleton: Arch. Int. Med., 1924, xxxiv., 228.
20. Feil and Gilder: Heart, 1928, viii., 1.
21. Ferguson: U.S. Naval Med. Bull., 1928, xxvi., 922.
22. Fischer: Wien. Arch. f. inn. Med., 1927, xiv., 405.
23. Franke and Wiener: Zeit. f. Kind., 1928, xlvi., 676.
24. Gallavardin and Froment: Jour. de Méd. de Lyon, Sept. 1930, p. 517.
25. Galli: Zeit. f. klin. Med., 1925, cii., 120; Gazz. d. osp., 1928, xlix., 1212 and 1481 and l., 102.
26. Gerander: Arch. Mal. du Cœur., 1928, xxi., 437.
27. Gilchrist: Amer. Heart Jour., 1926, i., No. 5.
28. Goodman and De Graff: Ibid., 1930, iii., 375.
29. Graber: Ibid., 1926, i., 564.
30. Hampeln: Jour. Amer. Med. Assoc., 1922, lxxix, 1184.
31. Hay: THE LANCET, 1921, ii., 750.
32. Herringham: Edin. Med. Jour., 1897, n.s., i., 366.
33. Hoffmann: Heart, 1911–12, iii., 213.
34. Hooker and Eyster: Johns Hopkins Hosp. Bull., 1908, xix., 274.
35. Huber and Enachesco: Bull. Soc. de pédiat. de Paris, 1928, xxvi., 544.
36. Hutchison and Parkinson: THE LANCET, 1914, i., 683.
37. Iliescu and Sebastiani: Heart, 1923, x., 223.
38. Kein: Jour. Amer. Med. Assoc., 1926, lxxxvi., 623.
39. Kroetz: Deut. Arch. f. klin. Med., 1922, cxxxix., 325.
40. Langley: Amer. Heart Jour., 1928, iii., 368.
41. Lankhont: Nederland. Tijdschr. v. Geneesk., 1922, ii., 1268.
42. Laubry and Mussio Fournier: Bull. et Mém. Soc. Méd. hôp. de Paris, 1925, xlix., 404.
43. Lenoble: Arch. Mal. du Cœur., 1922, xv., 15; Abstract. Jour. Amer. Med. Assoc., 1922, vii., 1167.
44. Leriche: Lyon Méd., 1924, cxxxiii., 379.
45. Levine: Boston Med. and Surg. Jour., 1921, clxxxiv., 53; Amer. Heart Jour., 1928, iii., 177; Jour. Med. Soc. New Jersey, 1929, xxvi., 138.
46. Levine and Blutner: Brit. Med. Jour., 1927, i., 7.
47. ,, and Fulton: Jour. Amer. Med. Assoc., 1929, xcii., 1162.
48. ,, and Stevens: Amer. Heart Jour., 1928, iii., 253.
49. Levy and Lewis: Heart, 1912, iii., 99.
50. Lewis: Mechanism and graphic representation of the heart-beat. London, 3rd ed., 1925.
51. Lian and Vian: Jour. Méd. franç., 1928, xvii., 237.
52. Luria and Vilensky: Klin. Med., 1929, vii., 1576.
53. Luten: Arch. Int. Med., 1925, xxxv., 74.
54. Major and Wahl: Amer. Heart Jour., April, 1930, p. 477.
55. Marvin: Heart, 1923, x., 279.
56. Mildolisi and Dionisi: Bull. e Atti. Accad. Med. di Roma, 1929, lv., 63.
57. Miller, Smith, and Graber: Amer. Heart Jour., 1927, ii., 479.
58. Oettinger: Semaine Méd., Paris, 1894, p. 470.
59. Oliver: THE LANCET, 1916, ii., 231.
60. Padilla and Corsio: Semana Méd., 1929, ii., 1781.
61. Palmer and White: Amer. Heart Jour., 1928, iv., 153.
62. Parkinson and Bedford: Quart. Jour. Med., 1927, xxi., 81.
63. ,, and Nicholl: THE LANCET, 1922, ii., 1267.
64. Porter: Amer. Jour. Med. Sci., 1924, clxvii., 821.
65. Poynton and Wyllie: THE LANCET, 1926, ii., 371.
66. Raymond: Progres Méd., 1926, xli., 1890.
67. Richnitzer: Wien. Arch. f. inn. Med., 1926, xiii., 227.
68. Rihl: Deut. Med. Woch., 1907, xxxiv., 632.
69. Ritchie: Edin. Med. Jour., 1926.
70. Robinson and Herrmann: Heart, 1921, viii., 59.
71. Russell and Ellison: THE LANCET, 1927, ii., 546.
72. Schwensen: Heart, 1922, ix., 199.
73. Scott: Ibid., p. 297.
74. Staemmler and Wohlenberg: Zeit. f. klin. Med., 1927, cvi., 425.
75. Stepp and Schliephake: Jour. Amer. Med. Assoc., 1926, lxxxvi., 78. (Abstract.)
76. Stewart and Crawford: Jour Clin. Invest. 1927, iii., 483.
77. Strauss: Amer. Jour. Med. Sci., 1930, clxxix., 337.
78. Strong and Levine: Heart, 1923, x., 125.
79. Thomas and Post: Jour. Amer. Med. Assoc., 1925, lxxxiv., 569.
80. Van Cleve: Ibid., 1930, xciv., 1758.
81. Wenckebach: Wien. med. Woch., 1928, lxxviii., 254.
82. Werley: Arch. Pediat., 1925, xlii., 825.
83. Willius: Amer. Heart Jour., 1927, ii., 449.
84. Wilson: Heart, 1921, viii., 303.
85. ,, and Herrmann: Arch. Int. Med., 1923, xxxi., 923.
86. ,, and Wishart: Amer. Heart Jour., 1930, v., 549.

GLASGOW HOSPITALS.—The new radiological department of the Western Infirmary has now been formally opened by Mrs. R. S. MacGregor who, with her husband, was among the largest contributors to the cost. It was stated that ten years ago the number of X ray photographs taken was about 6000, but that this year the number has increased to over 19,000.—Mrs. McCredie, daughter of the Lord Provost (Mr. Thomas Kelly), has opened an extension of the country branch at Drumchapel of the Royal Hospital for Sick Children. The enlargement consists of three main wards, two isolation wards, and a nurses' home. The branch will now accommodate about 80 children.

FILTER-PASSING TRANSMISSIBLE BACTERIOLYTIC AGENTS (BACTERIOPHAGE).

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In my paper entitled An Investigation on the Nature of Ultramicroscopic Viruses, published in The Lancet of Dec. 4th, 1915, I gave a broad description of the essential characteristics of the filter-passing transmissible bacteriolytic agents, now frequently described under the name of "the bacteriophage."

I showed that they could be found associated with various micrococci and with members of the dysentery-typhoid-*coli* group of bacteria, and that they possessed different degrees of activity. Unfortunately, I had no opportunity for some years to continue the research, but I discussed the significance of the phenomenon, and the variations which had been observed, at the annual meeting of the British Medical Association at Glasgow in 1922, and in several papers published a little later.

A very large number of researches on the phenomenon have since been carried out by workers in almost all countries. D'Hérelle, in particular, has made an extended investigation into most aspects of the subject. It has been suggested that the active agent, described by d'Hérelle under the name of "the bacteriophage," differs from the agents I described in my original paper. Although nearly 15 years have elapsed since my first publication, this view is still sometimes put forward, and appears to be based, partly at least, on a very narrow and critical interpretation of a few words and sentences in my paper.

In view of the importance which some workers attach to the small differences in some of the results we have described, and to the fact that d'Hérelle himself has again invited me to reply, I propose, in this short paper, to relate the circumstances which determine those differences, and to explain a little more fully a few facts given in my first paper, which may have been either overlooked or not fully understood, in the hope that other workers will then be in a better position to appreciate their significance.

In the first place, it is well to remember that human knowledge has advanced in all countries much more rapidly than has our means of expressing that knowledge in words. When, then, a description has to be short, the writer can only select the best words available from a language that has lagged behind knowledge, to describe his thoughts or experiments. I therefore ask readers of my original paper to judge my meaning from the paper as a whole, and not to select individual words or short sentences, and place these under a too narrow or exacting scrutiny, particularly where small variations in experimental technique may give rise to quantitative variations in results, or where a description has had to be condensed into a few words.

Nature of the Active Agent.

The nature of the active agent has been the subject of considerable controversy, some workers agreeing with d'Hérelle that it is a living virus, and some maintaining that it is not. I have observed that certain workers appear to believe that I am definitely against the virus theory. I wish therefore to make it quite clear that none of my writings is intended to convey that meaning. My attitude is that the nature of these agents is *not settled*. There are arguments that can be brought forward both for and against the virus theory, and I suggest that it is not in keeping with scientific principles to make a dogmatic assertion one way or the other until definite proof is forthcoming. This was the attitude I took up in my original communication, where I considered the possibility that it might be a virus, as well as various other possibilities. Moreover, I have discussed this question in considerable detail in two more recent papers.[1] This aspect of the subject cannot here be discussed *briefly* with any certainty that I will be correctly understood, so I hope readers will refer to these previous papers if they desire to become acquainted with my views.

In the past I have frequently alluded to the active agent as the bacteriolysin, but in this paper and in future writings I propose to refer to it either as "the bacteriophage" or as "the filter-passing transmissible bacteriolytic agents." The name "bacteriolytic agents" is probably less confusing than that of "bacteriolysin." When speaking of them as a group I may use the word agent in place of agents; and I may also use agent when describing the results of d'Hérelle, as I believe d'Hérelle is still of the opinion that there is only one bacteriophage. It will not always be necessary to use the full title, and in such cases "the lytic agent" or "the active agent" will be sufficient.

It has been observed that the characteristics of the filter-passing transmissible bacteriolytic agents which I described show that, in some respects, my results indicate a more complete action than that obtained by d'Hérelle for such a bacterium as the dysentery bacillus. I, however, would point out that my main description was based, chiefly, on the maximum effect I could obtain with an active agent and a susceptible micro-organism; and my detailed description applies particularly to micrococci and lytic agents which I obtained from glycerinated calf vaccinia lymph. I agree that the action may be much less complete with some strains of the lytic agents and with certain varieties of bacteria. In my paper I drew attention to that fact, and pointed out that my vaccinia strain of the active agent had some action, but "very much less" on *Staphylococcus aureus* and *albus* isolated from boils of man. Also, that I obtained "similar, though not such definite results with a micrococcus and a member of the *coli*-typhoid group" obtained from the intestine of a dog. On the other hand, a very active lytic agent was obtained from a case of infantile diarrhœa and vomiting in a child. It will be seen therefore that I agree as to the existence of filter-passing transmissible bacteriolytic agents possessing various degrees of potency, and recognise that different micro-organisms may possess different degrees of susceptibility. D'Hérelle, in his writings, maintains that there is only one bacteriophage, and, in effect, wishes to limit the use of this name to a particular strain. If, however, the name "bacteriophage" is to be retained, it can scarcely be applied to the intestinal strain, or type, isolated by d'Hérelle without its being also applied to the three intestinal strains which I had previously isolated. I suggest also that no evidence has been

[1] A Theoretical Study of the Nature of Ultra-microscopic Viruses, Veterinary Journal, August and September, 1922; and the Ultra-microscopic Viruses, Jour. State Med., August, 1923, vol. xxxi., p. 351.

brought forward that would justify our placing the strains I isolated from vaccinia in a different category.

When describing one of my experiments, I observed that when a pure culture of "the white or the yellow micrococcus" isolated from vaccinia is touched with lytic material, it "starts to become transparent or glassy, and this gradually spreads over the whole growth, sometimes killing out all the micrococci." To some workers this description indicates that my active agents differ from that described by d'Hérelle, as with his the action will not spread over the "whole" growth. André Gratia has shown that it is really a case of quantitative effect, and with this view I agree. In the sentence given above the word "whole" was not intended to be interpreted in its narrow sense under all circumstances and conditions, as is clearly shown by the use of the word "sometimes" which immediately follows. This is emphasised by the next sentence, which reads: "Experiments showed that the action is more rapid and complete with vigorous-growing young cultures than with old ones."

Conditions Favourable to Bacteriolysis.

Under very favourable conditions, it is possible to get a white or yellow micrococcus growth (isolated from vaccinia) so completely lysed that to the naked eye it appears to be entirely replaced by, or transformed into, a glassy, transparent or translucent substance. To obtain this maximum effect, the following conditions should be observed:—

(1) The lytic agent should be active. (2) The coccus should be susceptible, and must be the correct variety for the active agent used. (3) The culture should be very young. (4) The culture should be limited in extent, preferably to the lower part of the tube. (5) The medium should be in every way suitable to the lytic agent, and, in some cases at least, should be slightly alkaline. (6) The temperature should be suitable for the particular lytic agent used. (7) Plenty of moisture is advisable. (8) Probably the supply of oxygen should be limited.

It may be noted that capping the culture tube with gutta-percha tissue will assist in obtaining the last two of the conditions given above.

With further reference to the question of anaerobia, I have in the past stated that this does not favour the action. I believe, however, that this is due chiefly, if not entirely, to the fact that, under strict anaerobic conditions, the growth of many micro-organisms is either stopped or so far hindered that it becomes unsuitable for the action of the lytic agent; because an actively growing culture (although in the first few hours growth may not be visible) is probably one of the most essential conditions. It appears probable, however, that the lytic agent does not require a free supply of oxygen, for, in the case of some vaccinia micrococci and various members of the dysentery-typhoid-*coli* group of bacteria, the maximum *visible effect* of the lytic agent, in some experiments, occurs when the cultures are capped and are growing well; and we know that under these conditions the medium may be deprived of a large part of its absorbed oxygen.

That the correct temperature and correct oxygen supply are two of the important factors which determine the degree and rapidity with which lysis may take place is indicated by another aspect of the subject on which there has been some controversy. In my first paper occurs the statement that "if in an infected tube small areas of micrococci are left, and this usually happens when the micrococcus has grown well before becoming infected, these areas will start to grow again and extend over the transparent portions." Some workers have failed to obtain this result with "bacteriophages," so I propose to give shortly the conditions which should be observed in order to obtain this result. I would point out at once that the extension of the remaining coccus growth over the lysed areas will not as a rule extend far, owing to the exhaustion of the medium; but under suitable conditions a considerable extension can be obtained. The chief conditions that favour this result are:—

(1) The reaction of the medium should be more suitable to the growth of the coccus than to the action of the lytic agent.

(2) The culture should at no stage have become so overgrown with the coccus or bacterium that it has become exhausted of nutriment.

(3) The temperature should be changed from that most suitable to the action of the lytic agent to that which is relatively more suitable to the growth of the micro-organism. Under the conditions of the experiment it is best, with many types, to lower the incubator temperature to about 20° C. to 30° C.

(4) With aerobic micro-organisms the tube should be uncapped, to allow of a free supply of oxygen, and possibly some evaporation of moisture.

One may conclude, then, that this character is most easily demonstrated with an aerobic micro-organism which will continue to grow at a temperature and under conditions that are relatively less suitable for the action of the lytic agent.

It has also been said that in my first description of the lytic agents I made no allusion to the so-called inhibitory action, which is claimed to be a characteristic of the bacteriophage. I would, however, draw attention to various descriptions in my original paper which show clearly that I obtained these so-called inhibitory results. For instance, I stated, "and in some cases it is so active that the growth is stopped and turns transparent almost directly it starts." Further on, when describing the isolation of a bacillus from a case of infantile diarrhœa and vomiting, I stated, "but this was only so when precautions were taken to eliminate the action of a dissolving substance which infected the colonies so rapidly that they were dissolved before attaining a size visible to the eye." It is true, I did not describe these as inhibitory actions. On the contrary, I deliberately refrained from doing so, and for this reason: I had already shown that the lytic agent had little or no effect on dead micro-organisms, and from that I concluded that life with some growth of the micro-organism (however small or microscopic it might be) was essential to the action of the agent. In fact, I believed that some microscopic degree of growth always took place, even when the experiment *appeared to show* a true inhibitory action. Gratia demonstrated this on *Bacillus coli* in 1920. If, then, there is any divergence in this class of experiment, it is not in the results obtained, but only in the conclusions which some workers and myself have drawn from those results. That the action described as inhibitory and the action of lysis of visible growth are in fact manifestations of one and the same phenomenon has been very completely demonstrated by Gratia. At the meeting of the British Medical Association at Glasgow in 1922, Gratia showed a beautiful series of experiments in which he used the *same* filter-passing agent under varying conditions of experiment, and obtained the one or the other manifestation of the phenomenon according as he varied those conditions.

Another point in my original paper that has occasionally been considered as not applying to the

bacteriophage is my observation that "on examination of these glassy areas nothing but minute granules, staining reddish with Giemsa, could be seen." It has been said that these granules do not occur with the true bacteriophage. I would, however, point out that to find many of these granules it is necessary to repeat my experiment and to examine the material in its most concentrated form, such as occurs when surface growth has been lysed. In my paper I made no suggestion that the granules could be easily found and distinguished in fluid cultures, or in cultures that showed no visible growth of the micro-organism. Moreover, it is probable that some, if not all, of these granules represent the remains of the broken-down micro-organism. In this case the number and the size of the granules must depend, to some extent at least, upon the number and upon the variety of the micro-organism that has been acted upon.

The Culture Media.

I wish now to give some consideration to the question of the different types of media that have been used. It has been assumed by some that my results were confined to agar cultures. If, however, reference is made to my original paper, it will be noted that, in the first part, I mention that in my investigation of the ultra-microscopic viruses "several hundred media were tested," and that it was "impossible to describe all these in detail, but generally agar, egg, or serum was used as a basis." Naturally, when testing so many types of media, a certain number of fluids, including broths, were used, and many experiments with the transmissible bacteriolytic agents were made on these media. If my description was based on agar cultures it was because on this medium the fundamental characters of the lytic agent appeared to be demonstrated better than on any other, and circumstances compelled me to be as short and concise as possible. In particular, the experiments on agar demonstrated one of the most important characters of the active agent. They showed that the action started from definite spots or areas, and that these varied in number according to the dilution of the active agent. On the other hand, fluid cultures do not show any fundamental characters that cannot be demonstrated on agar, although for certain experiments broth cultures may be more convenient to use. Here it may be noted that egg media are particularly suitable for use when making primary cultures to isolate some strains of the active agent.

When the action takes place on certain micro-organisms a halo may occur in the medium. This was first described by Gratia, since when there have been discussions as to its significance. I have also observed this character, and here I may say that I have found it to be associated with the production, or setting free, of some alkali or alkaline substance. This is particularly marked when certain micrococci, such as varieties which can be obtained from urine, are lysed by the active agent. From this it would appear that the reaction of the medium and its constitution will have some effect on the result.

Thermal Death-point of the Bacteriophage.

The temperature at which the active agent is destroyed has also been the subject of considerable discussion. In my first paper I gave the thermal death-point as 60° C., whereas d'Hérelle, in his papers, has given it as 70° C., or over, for the bacteriophage. André Gratia and others have pointed out that the critical temperature is relative, and varies with different bacteriophages, and with this view I agree. It must be remembered that my experiments on the thermal death-point were carried out on the lytic agent found in association with white and yellow micrococci isolated from glycerinated calf vaccinia lymph. I did not in that paper give any exact figure for the bacteriophages which I had found in the intestinal tract associated with other bacteria, such as those belonging to the dysentery-typhoid-*coli* group. It must also be noted that the results obtained in such experiments depend, to some extent, on the exact conditions of the experiment, and particularly on the exact constitution of the fluid containing the active agent and on the volume of fluid heated. In my experiments I used a small portion of the glassy lysed coccus, and made this into an emulsion with 0·85 per cent. sodium chloride in distilled water. The emulsion was drawn up into *small capillary tubes*, which were then sealed at both ends and completely immersed in the water bath. Full details of confirmatory experiments were given in my paper on the Transmissible Bacterial Lysin, published in THE LANCET of Sept. 26th, 1925. If these conditions of the experiment are altered in certain directions the thermal death-point may appear to be raised, but in my experiments I took care to avoid any circumstance or condition coming into play that might protect the lytic agent. I, however, agree with d'Hérelle and some other workers that the thermal death-point may be higher than that for the particular strain of the agent which may be found in association with micrococci in vaccinia; and even from vaccinia one can often get a strain that is not completely destroyed at 60° C. It would, indeed, be strange if such a variation did not exist.

Original Studies not Completed.

It is to be hoped that the details I have now given will be sufficient to enable other workers to obtain all the results I gave in my original paper. If the first description of those results was not quite complete in every detail, it must be remembered that it was published in 1915 when circumstances compelled me to be as brief as possible. In any case, it would have been impossible in a single paper to have submitted every aspect of a phenomenon which has since proved to offer such a wide scope for theoretical discussion and experimental investigation. Moreover, in view of certain criticisms that have been made, I feel bound to place on record the fact that my paper was submitted for publication when my financial grant from the Local Government Board ceased and I had been asked to undertake laboratory duties in the Army, and it was actually published only a few weeks before I was ordered to Salonika. From a study of the last three paragraphs of my original paper it will be clear how anxious I was to obtain the necessary filter-passing transmissible bacteriolytic agent for the Shiga and Flexner types of dysentery bacilli, and to test vaccines prepared from the active agent and the lysed bacteria. The matter was brought up for discussion in 1916, at a meeting in Salonika, which was attended also by officers of the French and Canadian medical staffs. Unfortunately, this and other attempts on my part to be allowed to continue the investigation were not approved partly, I think, on account of the amount of routine work which had to be carried out in connexion with the sickness that was prevalent. It was some time after the end of the war before I was really free again to continue the investigation, but by that time most of the additional details of the

phenomenon had been published by other workers under the title of "the bacteriophage." So I passed on to other work.

D'Hérelle, in a communication published in the *Bulletins et Mémoires de la Société Nationale de Chirurgie*, dated May 17th, 1930, complains that I have never answered any question put to me regarding the phenomenon I described. I admit that with one or two exceptions this is true, in that I have, as far as was possible in my writings, avoided entering into a discussion that I believed would serve no useful purpose. This applies to the claim made by d'Hérelle that there are certain differences which represent important points of distinction between his bacteriophage and the filter-passing transmissible agents which I previously described. I was convinced that sooner or later their identity would be recognised, and I felt content to leave this aspect of the subject to the judgment of independent workers.

In the paper to which I have referred d'Hérelle draws attention to the descriptions given by certain workers on *Bacillus pyocyaneus*. It is suggested that some of these results represent a phenomenon that has no connexion with the bacteriophage, but has a certain resemblance to the phenomenon I described. More direct suggestions have also been made in the past that, *unlike those obtained with the bacteriophage*, my results indicate a degenerative process. I must confess I am unable to appreciate arguments of this kind, and I prefer to reply by referring readers to my original paper. I would, however, point out that I have carried out no work on *B. pyocyaneus*.

Properties of the Bacteriophage.

In the same paper d'Hérelle submits that there are three properties, among others, by which the bacteriophage is distinguished. In order that there may be no further complaints regarding my silence I will now consider this claim. The points mentioned by d'Hérelle refer to a certain reaction demonstrated by a resistance of the bacterium to the action of the bacteriophage, and to the character of progressive adaptation to resistance against antiseptics and the production of a specific anti-bacteriophage principle in the blood of inoculated animals. I suggest that these are minor points of detail, where one would expect the results of experiments to vary according to the strain of active agent used. The exact meaning of the first point is not quite clear. If it refers to the production of a strain of a bacterium that is resistant to the action of the bacteriophage, then it will be sufficient to point out that adaptation is a character of bacteria, and it can be demonstrated when bacteria are placed under the influence of some substance which is harmful to them. In the case of immunity reactions in particular it is probable that some strains of the lytic agent would prove to be more toxic than others. It is also possible that the nature of the micro-organism, associated with the agent, will have some effect in determining results. I doubt if the active agent has ever been freed from the products of the broken-down micro-organism, and although these products may not produce their characteristic immunity reactions, they may still be toxic in another way, and so affect the results obtained with different strains of the active lytic agent. If, however, d'Hérelle should show that some strains of the active agent conform to his requirements while others do not, it will be interesting, and his experiments might confirm the generally accepted view that there are more strains or varieties than one. In any case, in my paper I did not describe any immunity reactions, nor did I go into the question of adaptation to resistance against antiseptics. My original strains of the lytic agent died out during the war, and obviously it can never be known with *absolute certainty* to what extent my particular strains would have conformed to such details; but this would appear to be equally true for many strains since described under the name of "the bacteriophage."

As regards my own strains, I would again remind readers that, in addition to those I obtained from vaccinia, I also isolated two from the intestinal tract of a dog and one from the intestinal tract of a child. All these strains showed the same fundamental characters, of which the most important are:—

(1) They passed a porcelain filter.

(2) They increased in quantity, or multiplied, when associated, under suitable conditions, with cultures of a micro-organism that was susceptible to the particular strain used.

(3) They grew, or lived, or existed with, and at the expense of, the micro-organism, and this fact could be demonstrated by the lysis of a culture. This lysis, in some cases, might be so rapid and complete that the culture never showed sufficient growth to be visible to the naked eye, and might therefore give the appearance of an inhibitory action.

(4) When the active agent was sufficiently diluted, and was acting on visible growth of a micro-organism on a solid medium, then the action started from definite points or spots. When, also, a series of experiments was made it was found that the number of these spots diminished as the agent was further diluted. Under suitable conditions the "glassy" or clear spots increased in size.

(5) The agent could be communicated from one culture of a susceptible micro-organism to another of the same strain, in series, for an indefinite number of generations. This was equally true if the active agent was each time diluted with fluid and passed through a porcelain filter before being used.

Now, the agent described by d'Hérelle, under the name of "the bacteriophage," conforms to all of these fundamental characters. It is, therefore, a filter-passing transmissible bacteriolytic agent, and it was these agents that I described in my original paper.

CONTACT GLASSES FOR AMETROPIA.

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As the literature on this subject is still very scanty, the following notes are written to give a brief description of the glasses themselves, their uses, and the procedure adopted in prescribing them. Although the suggestion was not new even then, the Swiss ophthalmologist, Dr. A. E. Fick, in 1887 advocated contact glasses for the relief of keratoconus or conical cornea. At that time and for long afterwards the resources at the disposal of the optical manufacturer were unequal to the task of grinding glass to the necessary shape. The practical difficulties are obviously great. The shape of the glass is peculiar. It has an edge and one projecting rim which must be carefully rounded off and polished. Its curves must be optically exact. The glass is very thin and the difficulties in working the material are increased by its hardness. To produce a shell fulfilling these conditions out of a single piece of glass represents a triumph of optical achievement. In the earlier experiments of Fick and others, attention was drawn to the possibility of manufacturing glasses by blowing, and very successful results were sometimes obtained, especially by Müller of Wiesbaden. In blown-glass work, however, success in attaining the right form, even in

the hands of the most skilled craftsman, is largely in the nature of a happy accident. Occasional examples are perfect but cannot be uniformly repeated. Further, perfect optical efficiency of the outer surface is almost unattainable. Efforts were also made to mould glass into the necessary shape and materials other than glass were experimented with. It has all along been agreed that a ground glass, with surfaces based on accurate optical calculation, was the ideal, and within the past few years, largely as a result of the experiments and persistent advocacy of Geheimrat Prof. Heine of Kiel, this ideal has at last been realised by Messrs. Zeiss of Jena.

FIG. 1.

Description of the Glasses.

The modern ground glass (Fig. 1) is a thin, hollow glass bowl which fits on to the anterior part of the eyeball beneath the lids, in contact with the sclera but separated from the cornea by a fluid meniscus. It consists of a central, optically effective crown, which forms an arc of a sphere, surrounded by an optically ineffective peripheral brim, which also is spherical. The former may be called the corneal portion; the latter the sclerotic. The material is crown glass which has in sodium light a refractive index $\mu = 1{\cdot}516$, and is chemically highly resistant in order to withstand the corroding action of tears. It is well known that lacrymal secretion is destructive of glass. Artificial eyes soon become eroded.

The central or corneal part has a diameter of approximately 12 mm. and is about 0·5 mm. thick at the vertex. The diameter of the sclerotic zone (i.e., of the whole glass) is about 20 mm., and the total weight of the glass only 0·5 g. (grs. 7). It is thus easily carried by the eyeball in its movements around the centre of rotation.

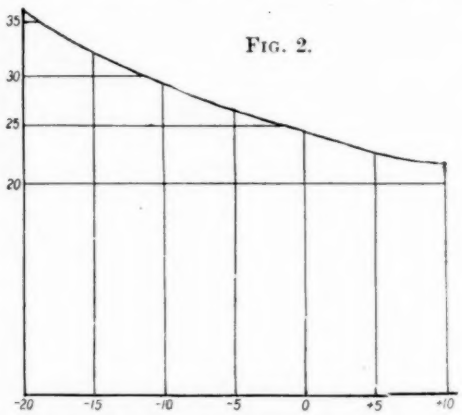
The function of the contact glass is to give a clear image of a distant object at the macula. For the correction of axial ametropia its corneal curvature, in combination with the fluid meniscus and the ocular lens system, must be designed to shift the posterior focus in eyes which vary in axial length from as low as 21 mm. to as high as 36 mm., representing all degrees of refractive error from about plus 10 D. to minus 20 D. (Fig. 2). Astigmatism need not be considered. The effect of the fluid meniscus between the cornea and the glass is that the cornea as an optical entity disappears. Except in later life, when senile changes occur in the lens, astigmatism is practically always corneal. With a contact glass, therefore, astigmatism is abolished. The problem is to select a glass by means of which the posterior focus of the combination (contact glass + fluid meniscus + ametropic ocular system) is at the fovea centralis retinæ; in other words, the posterior focus is shifted forwards for hypermetropic eyes and backwards for myopic ones.

The corneal crowns of contact test glasses have no optical power in air. The effect just described is entirely due to the fluid meniscus lying between the cornea and the inner surface of the glass. The refractive index of the cornea is approximately $\mu = 1{\cdot}376$ and that of tears approximately $\mu = 1{\cdot}336$. It follows that the fluid used should resemble tears. I have hitherto used normal saline solution (0·9 per cent.) which is almost isotonic with tears. Ridley, however, has recently drawn attention to the high protein content of tears, and I have lately experimented with other solutions which more nearly resemble his analyses. I may mention that in the earlier experiments a sugar solution was used.

Fitting and Prescribing Tests.

For the examination of the patient Messrs. Zeiss now supply a trial set of test contact glasses. The latter are arranged in series of three according to three standard scleral measurements. Each series has the same range of corneal radii—viz., from 5 to 11 mm.—representing the radius of curvature of the inner surface. The radii of the inner scleral curvatures measure 11, 12, 13 mm. respectively. These figures are etched on the rim of each glass in the trial case. Another figure which is also supplied denotes the vertex thickness of the test glass. It should be noted that the radius of the inner surface of the corneal portion is taken as the standard, as that of the outer surface varies according to the requirements of the patient. This point will be apparent later when the details of prescribing are considered.

FIG. 2.



Relation of axial length to axial ametropia.

The examination is apt to be tedious both to the patient and to the surgeon. After examining the eyes in the ordinary way, and determining the amount and character of the refraction, the process of selecting the best contact glass is begun. As several may have to be fitted and removed at each consultation, the conjunctiva must be anæsthetised. Holocaine drops (2 per cent.) are preferable to cocaine as it does not

dilate the pupil. I have, however, sometimes used 2 per cent. cocaine. A Petri dish filled with warm normal saline is convenient for handling the contact glasses. A small rubber sucker pressed on to the convex surface easily picks one up. The glass is held vertically by the attached bulb and filled with saline from a pipette. The patient leans forwards until his face is almost horizontal, and while he is in this posture the surgeon controls the eyelids with the fingers of his left hand and directs the patient to look at the glass. The contact glass containing saline must be kept level and gradually apposed to the cornea, the lids being at the same moment swept over it by the left hand and the suction bulb removed. It is not easy to control involuntary movements of the lids. When one occurs part of the fluid gets spilt and a bubble of air appears between the cornea and the glass. The bubble is a sore trial. It may recur again and again and there is nothing to be done but each time to take out the glass and start afresh. A small ivory spatula is provided for the removal of the glass. This is inserted under the rim so that the fluid drains away and the glass is allowed to drop on to a towel. During the examination, however, it is easy for an ophthalmic surgeon, who is accustomed to handling eyes, to dislocate it from its position by manœuvres of the lids.

Two separate and distinct determinations have to be made during the examination: (1) that of the most accurately fitting scleral brim; (2) that giving the necessary refractive power. To settle the first, the surgeon selects one of the three standard types of scleral measurements, and, having placed the glass in position, makes a careful examination by means of a good light and condensing lens. An accurate fit is indicated by a complete zone of adhesion near the limbus. If contact is greater at the periphery than at the limbus the rim will rub, irritate, and become intolerable. Such a glass must be rejected and one of the others tried. Good vision depends entirely on corneal curvature, but comfort depends on scleral curvature, and every effort must be made to get this right. It is even recommended that this should be done by examining the zone of contact with a slit-lamp and corneal microscope, but in my experience good focal illumination and a loupe give all the help that is required.

Having settled the matter of scleral fitting, the second problem, correction of the ametropia, remains to be considered. The particular glass to be tried first depends on the type of refractive error. For a patient with high hypermetropia, for example, one begins with a glass of small corneal curvature. Should the patient read 6/18 or better on the distant test-types, a trial frame is placed before the eyes and spheres (+ or −) added in order to decide whether vision can be still further improved. According to the result obtained other contact glasses, either with greater or less corneal curvature, are indicated, until the final result giving the best vision, with or without spherical additions, is arrived at. Where spherical additions are necessary it is important to ascertain another measurement, that between the vertex of the contact glass in situ and the back of the sphere in the trial frame. The best way to take this is with the Wessely keratometer, but there is no reason why a specially shaped millimetre scale should not be placed in actual contact with the vertex of the glass and the measurement read directly. The necessary data for writing a prescription are now available. These are: (1) the scleral radius; (2) the corneal radius; (3) the amount (in dioptres) and sign of any additional correction; and (4) the distance in mm. between the inner spherical vertex and the contact glass vertex. With regard to (3) it should be noted that the additional spheres ought not to be higher than about 4 D., otherwise the contact glass would become too heavy.

After the prescription has been dispensed the patient again attends in order to have his glass inserted by the surgeon. Most patients acquire tolerance surprisingly soon. At first he is advised to wear the glasses for a few hours only at a time, gradually lengthening the period until they can be worn all day without discomfort. They must always be removed at night.

Advantages.

This is not the place to discuss fully the advantages of contact glasses over spectacles, especially the optical considerations involved, but one or two points may be alluded to. Perhaps it may seem a disadvantage that for presbyopic patients a pair of reading spectacles is still necessary, but, as the strength of the reading correction need hardly ever be more than 2·5 D., a very light pair is all that is required. A consideration that is perhaps not so important now as formerly is that contact glasses are practically invisible. There are still circumstances, however, when this is desirable. The ametrope, especially the myope, has restored to him a full field of vision and full range of movement. The retinal image of the myope is magnified, up to 50 per cent. in some cases; that of the hypermetrope is much less influenced. This fact is susceptible of optical proof, but it is sufficient now to state that an enlarged image is a property of a long focus, such as the addition of a contact glass must of necessity confer. It assumes importance also in cases of anisometropia. It should be stated that contact glasses are not suitable for the treatment of squint. Perhaps their greatest value is in cases of corneal haze or irregular astigmatism, including conical cornea, which cannot be helped at all, or only to a slight extent, by ordinary glasses.

While the use of contact glasses and their possibilities cannot yet be said to have been fully explored, my brief experience has already convinced me that they have come to stay, and that in the future they will be found to constitute a very important addition to the methods now available for conserving and treating defects of vision.

LITERATURE.

Fick, A. E.: Eine Contactbrille. Archiv. f. Augenheilk., 1888, xviii., 279.
Deutsch, A.: Über die Verwendung von Kontaktgläsern bei irregulärem Astigmatismus und hoher Ametropie Klin. Monats. f. Augenheilk., 1929, lxxxii., 295.
Heine, L.: Über den Ausgleich sämtlicher Brechungsfehler des Auges durch geschliffene Haftgläser. Münch. med. Woch., 1930, lxxvii., 6 & 271.
Hartinger, H.: Zur Theorie der Haftgläser. Zeit. f. Ophthal. Optik., 1930, xviii., Heft 5 & 6.
Ridley, F.: Intra-ocular Pressure and Drainage of the Aqueous Humour. Brit. Jour. Exp. Path., August, 1930, p. 217.

DONATIONS AND BEQUESTS.—Miss Alice Jane Davis, J.P., Belhaven-terrace, Kelvinside, Glasgow, left £2000 to the Western Infirmary, £1000 to the Royal Infirmary, and £500 to the Hazlewood House for Retired and Aged Nurses.—Alderman John William Turner, of Staincliffe, Batley, gave everything to his wife for life, and then £1000 to the Batley and District Hospital.—Over £20,000 will pass to charitable objects under the will of Miss Grace Lamb, of Bowdon, Cheshire, who left £48,570. Subject to various legacies she gave the residue of her property, about £20,000, between the Manchester Infirmary, the Altrincham Hospital, and the Prisoners' Aid Society, Manchester. She also appointed her one-tenth share of certain settlement funds to Ancoats Hospital, Manchester.—The Ingham Infirmary, South Shields, has received a cheque for £1000 from Mrs. C. W. Taylor, of Westoe Village, to endow a bed in memory of her son, Lieut.-Commander C. R. R. Taylor.

CLINICAL AND LABORATORY NOTES

CAUTERISATION OF ADHESIONS

IN TREATMENT OF BRONCHIECTASIS BY ARTIFICIAL PNEUMOTHORAX.

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THE intrathoracic cauterisation of adhesions which are preventing the complete collapse of the lung is now a well-recognised procedure in the treatment of pulmonary tuberculosis by artificial pneumothorax.

Although artificial pneumothorax has been used as a therapeutic measure in some cases of bronchiectasis, we have been unable to find any records in the literature of the cauterisation of adhesions, which may be preventing complete collapse, in cases of bronchiectasis. We have had under our care two cases in which complete collapse was prevented by adhesions to the parietal pleura, and in which it seemed justifiable to attempt to obtain a complete collapse by division of the adhesions.

The procedure used in the cauterisation was that suggested by Maurer—i.e., enucleation of the adhesion at its parietal end; as the danger of infecting the pleura is more real in this disease than in tuberculosis, it is essential to use this method.

It is necessary to anæsthetise the pleura. For these two cases the Davidson one-way instrument was used. Although in the Chandler-Schranz instrument a special injectoscope has been devised, this necessitates another somewhat expensive appliance, and we have found our method quite satisfactory in practice when this instrument has not been available. Having localised the adhesion previously by X ray examination the instrument is introduced at right angles to the parietal end at what one judges to be 4 or 5 inches distant from it.

The probable site of the base of the adhesion under the external chest wall is judged by any one or a combination of three methods:—

(1) The instrument is advanced until it is as near to the base of the adhesion as possible, and from without the point of maximum light seen through the chest wall is marked on the skin overlying this area; as the light is diffused this method is not very accurate.

(2) The base of the adhesion is viewed through the instrument and, taking into consideration the angle of vision of the particular instrument, a finger is placed on the external wall of the chest at the judged insertion of the adhesion; this point is marked.

(3) The instrument is introduced until it touches the adhesion, and the straight line which it would make if continued through the chest wall is noted and marked.

The base of the adhesion having been thus localised on the external chest wall, a long stout hypodermic needle attached to a syringe containing 2 per cent. novocain is introduced through the nearest intercostal space and watched through the thoracoscope as it enters the pleura. With this method we have been successful in striking the base of adhesions only a few millimetres in diameter on the first trial; if, however, the point of the needle is a centimetre away it can usually be made to reach the base of the adhesion through the same skin opening. If the adhesion is not accessible directly, being under the scapula, a long needle such as may be used for splanchnic anæsthesia may be introduced from the side of the chest opposite to the adhesion and guided into the adhesion from the intrathoracic side. Successful collapse was obtained in both cases recorded.

CASE 1.—A female, aged 13, had had bronchiectasis of the left lower lobe since the age of 6, following a pneumonia. Artificial pneumothorax was induced on Oct. 4th, 1929. A skiagram on April 8th, 1930, showed the upper lobe completely collapsed and the lower lobe partly collapsed but held up by adhesion running from its upper part to the parietal pleura in the region of the fourth rib posteriorly. Cauterisation was performed on May 10th. A skiagram taken the next day showed division of the adhesion and further collapse of the lower lobe. The subsequent progress was satisfactory.

CASE 2.—A female, aged 11, had very extensive bronchiectasis on the left, diagnosed in 1925, when she was admitted to Victoria Park Hospital with a view to artificial pneumothorax. In consultation with our colleague, the late Dr. Clive Riviere, the idea was abandoned for fear of infection of the pleura; at that time artificial pneumothorax was not regarded favourably in bronchiectasis. In January, 1929, Mr. George Waugh (Hampstead General Hospital) performed a phrenic avulsion in an endeavour to ameliorate the condition. Some improvement followed. In December, 1929, the child started to have profuse hæmoptysis, and was admitted to Victoria Park Hospital with the idea of a thoracoplasty. Artificial pneumothorax was first attempted, and—very unexpectedly—was successful in producing a good collapse except for one wide adhesion. This adhesion was successfully divided, and a complete collapse was obtained. The hæmorrhage ceased and the child's general condition improved.

The cauterisation of adhesions in artificial pneumothorax induced for the treatment of bronchiectasis appears to be as successful in producing a collapse of the affected lung as it is in most cases of pulmonary tuberculosis.

PULMONARY EMBOLISM IN AN INFANT

FOLLOWING AURAL INFECTION.

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THE extreme rarity of pulmonary embolism in childhood makes the following case worthy of record.

A female infant, 7 months old, was admitted under my care in hospital on April 30th, 1930. When 3 months old she had had pneumonia, after which both ears had started to run. On April 20th she seemed to have pain in the left ear and the discharge lessened. On April 27th a swelling appeared behind the left ear and gradually increased. On examination a typical acute mastoid abscess was observed on the left side. The right ear was also discharging. The heart and lungs were examined and no abnormality was found.

On May 1st a Schwartze operation was performed. The next eight days were uneventful, the infant apparently making excellent progress, while the local condition was entirely satisfactory. On May 9th at 2.30 A.M. the resident surgical officer was hurriedly summoned to see the infant, whom he found cyanosed and with very rapid respirations. The onset was quite sudden, the child having been apparently quite well a few minutes before. Oxygen was given through nasal catheters and camphor was injected. Death occurred at 6.30 A.M.

Permission was given for a modified post-mortem examination which did not allow the skull to be opened. This was performed by the resident surgical officer, Mr. Peake. Old clot, rounded, was found blocking the branches of

the pulmonary artery to both lower lobes and right middle lobe. There was no pneumonia, but these lobes were collapsed. Emphysema of the upper lobes was present. The heart was normal. Unfortunately the condition of the ears and lateral sinuses could not be discovered.

There are 11 recorded cases of pulmonary embolism in childhood, 8 of which were due to aural infection. In 1905 Pehu and Horand reported a case in a child of 6 years. A similar case was recorded by Guillemot in 1906, and in 1913 Lutz reported six cases. The remaining three were due to other causes.

REFERENCES.

Smellie, J. M.: Arch. Dis. Child., 1929, iv., 328.
Stulik, C. K., and Rust, B. K.: Amer. Jour. Dis. Child., 1929, xxxvii., 1246.
Wessen, N.: Acta Chir. Scand., 1921–22, liv., 123.
Lutz, W.: Berl. klin. Woch., 1913, l., 1566.
Guillemot, L.: Bull. Soc. Pédiat., 1906, viii., 229.
Pehu, M., and Horand, R.: Lyon Méd., 1905, civ., 1307.

MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society on Nov. 10th, with Dr. R. A. YOUNG, the President, in the chair, Prof. CHEVALIER JACKSON (Philadelphia) opened a discussion on the diagnosis and treatment of

Malignant Disease of the Lung.

Many misgivings beset him, he said, when he contemplated taking part in this discussion. The bronchoscopist lacked the viewpoint of the internist and the surgeon, and this prevented him from having a comprehensive outlook on such a subject. However, clinical experience was clinical experience always, and facts were facts. Experience was that which was gained while looking for something else, and this was true for cancer of the lung.

Prof. Jackson's address consisted in the exhibition and explanation of photographs and radiograms of cases, with brief histories and results. Usually, he said, lymphoma was not regarded as malignant growth, and yet some of his cases of lymphoma presented many of the characteristics of malignant disease. He had had 14 or 15 cases of malignant disease associated with foreign body. A slide shown was that of a man who had cancer in the right lower lobe of the lung and also a tooth in the lung. A woman came to the radiologist with a pin in the lung and she died of hæmorrhage. The autopsy revealed a large cancer involving the right lower lobe in the same region as that in which the pin was found. That might not be more than a coincidence. Another patient came with advanced asthma; bronchoscopy was asked for, and a fungating granuloma was found which appeared to be in the trachea. It turned out to be epithelioma. Another was a man who had been spitting up pus for three years, and was having rises of temperature, but he was said never to have spat up blood. The radiologist suspected malignant disease in the left upper lobe. Bronchoscopy revealed a fungating, bleeding, oozing lesion, and histological examination showed it to be cancer. Another patient had been spitting up blood ten years, and he was thought to have a pulmonary abscess by the radiologist who saw him first. Later examination with X rays gave rise to the suspicion of malignant disease, for he was having fever of the intermittent septic type, and was spitting up quantities of foul pus. Bronchoscopy showed there was a cancer in the right main bronchus. Another man had had a cough 20 years, and a fungating lesion was found which had epithelialised; it was not bleeding, but was a nodule which could be nipped off. It proved to be carcinoma.

Prof. Jackson showed photographs of a case of atelectasis of the right lower lobe. Occasionally, he said, atelectasis would light up quickly. If atelectasis occurred slowly it might be due to absorption of air by the circulating blood, but when it was suddenly produced he believed it was due to a check-valve action pumping air out of the lung. In one such case he found a nodular fungating lesion, a floating tumour in the bronchus. He excised it, thinking it was a fibroma, 16 years ago. It was endothelioma, and it never recurred.

The treatment of cancer of the œsophagus by deep X ray therapy had been very disappointing in comparison with treatment of the lung. The mortality of cancer of the œsophagus still remained at 100 per cent. when treated with deep X ray therapy. The experience at his clinic had been that there were some malignant growths in the lung of a very low grade of malignancy, and which were quite sensitive to X rays and amenable to that treatment. Whatever might be said about lobectomy, it could be stated that it had never had a fair chance for a test, because cancer of the lung was almost never diagnosed early. It would always be recognised late until every patient suspected of pulmonary tuberculosis was examined with the bronchoscope. A very important sign in the diagnosis of malignant disease of the lung was a wheeze heard at the patient's open mouth; it was not heard at the chest wall. At his suggestion those at the clinic had adopted the maxim "all is not asthma that wheezes."

After showing a cinematograph film illustrating methods of examination and the appearances seen through the bronchoscope, Prof. Jackson said he was not an enthusiast about radium and radon seeds in cancer of the lung. Until more was known of ætiology of cancer and methods of treating it, lobectomy and radiology should receive special attention. It was a platitude in the profession that diagnosis of cancer should be made early, but it was not so well known that the bronchoscope should be used early; he did not know any other way of making an early diagnosis of cancer of the lung.

DISCUSSION.

Mr. V. E. NEGUS pointed out that in only a small percentage of cases of bronchoscopy was the reason the presence of a foreign body. Of 200 bronchoscopies he had performed, only five were for foreign body, the remainder being for other causes. To do this work with success a good deal of attention to small details was required, and that was one of the secrets of Prof. Jackson's great reputation, both as an operator and a teacher. It had been said that a drawback to a more general use of bronchoscopy was the difficulty of getting trained assistants, but this was only a partial difficulty if care was taken in the teaching; even at hospital, with a change of assistants and nurses every six months, it was possible to get success and he used local anæsthesia. Many thought bronchoscopy was unsuitable because a general anæsthetic was needed; not only was it unnecessary, but a patient with carcinoma of the lung was not a suitable

subject for a general anæsthetic. He used morphia and scopolamine. He exhibited a glass bronchoscopic shield which he had had made, in order to protect the face of the observer from the coughing up of discharges. When one part of the shield was befogged by the patient's expectoration a clear part could be turned and the observation continued.

Dr. J. F. BRAILSFORD showed pictures of a case in which bronchoscopy would not be of much use. There was a dense shadow, which very slowly increased in size, and no diagnosis could be arrived at. The patient had a temperature, and there was pain over the area; a needle inserted failed to withdraw anything. In the later stages growth was suspected, and eventually it was found to be sarcoma of the rib.

Mr. HERBERT TILLEY said that one of the main points in the opening address was that many lesions which clinically appeared to be of the ordinary type turned out to be malignant, and he showed slides of a case in which the symptoms suggested malignancy but it turned out to be benign. The man was gassed in March, 1918, and his symptoms dated from the gassing. In the October following he began to suffer from hæmoptysis, and later he had stridor and expectoration, with dyspnoea. The stridor was marked, and he had impaired respiration. X rays showed an infiltration round the right bronchus. In the consulting room the stridor and distress were very noticeable, and he was taken into a home and the tumour which was seen by radioscopy was removed. It was projecting into the trachea, and there was a complete check-valve action. It proved to be a papillary granuloma. Usually it was found that a supposedly benign growth turned out to be malignant, but in this instance it was the reverse.

Mr. H. P. NELSON pointed out the importance of irradiating the glands, and explained his investigations with this object. On the cadaver he was able to push radon seeds through the bronchial wall into the glands. Radon seeds could not be got into the hila, for that would mean too great a displacement of trachea and bronchi. He had succeeded in introducing radon seeds by means of a diathermy current of low amperage, and with very little bleeding.

Mr. J. E. H. ROBERTS said he felt that surgical removal was not, and never would be, of much use in the majority of cases of carcinoma of bronchus or lung. The future, in his opinion, lay in irradiation, by X rays, radium, and radon. He showed an apparatus by which a number of radon seeds could be propelled into a growth from the handle of the machine. The problem of inserting radon seeds into the lung through an open thoracotomy was not a simple one, for in a large number of cases infection was already present in the pulmonary airways; and if the lung was to be punctured through an open thoracotomy wound, there was grave danger of causing pyothorax, which in such a patient might rapidly cause death. He felt that the mode of use of radon seeds into malignant growths had long been haphazard; instead of the few seeds used as a rule, there should be a dozen, perhaps two dozen.

Mr. TUDOR EDWARDS said there appeared to be two types of growth which arose in the lung. A good deal had been heard about the primary bronchial growth, but there was another type, a rarer one, arising in the periphery of the lung. Two months ago, in a paper he read at Winnipeg, he recorded 116 cases of growths of the lung itself which he had seen, and only eight of them arose in the peripheral parts of the lung. In three he attempted removal of the growth. One was an epithelioma, and it recurred in three months; he did a partial lobectomy of the lower lobe. Both the others were endotheliomata. One died owing to a technical operation error, and the other was operated upon two years ago, having the lower lobe removed, and he was alive and well to-day. Now and again one encountered a secondary growth which justified removal, but usually secondary deposits were multiple. There was a smaller probability of being able to successfully remove bronchial new growths; they arose from near the main bronchi, and that meant requiring a complete pneumectomy, which was impossible. Still, he removed in January last a growth which seemed central to the bronchus, a columnar-celled carcinoma the size of a walnut, and the patient survived and was, he believed, alive to-day. He had been disappointed with the results of X ray treatment of pulmonary growths, for they did not seem to react well to the rays. He showed an instrument, consisting of a double tube, for the introduction of radon seeds, capable of holding two dozen seeds, and the seeds could be introduced through the bronchoscope. Its object was to keep the lumen open and prevent the stagnation which was a factor in keeping the patient somewhat ill. He had kept such a tube in situ for six and a half days, and he thought this time could be extended.

Dr. G. VILVANDRÉ thought that some 90 per cent. of the growths in the lung visible by X rays were carcinomatous, and obviously were such as were difficult of removal. He described a case in which he was able to prove that each radon seed had a marked influence on the surrounding tissue only to the extent of 1 cm., thus supporting the contention of those who advocated many seeds, so as to ensure every part of the growth being irradiated. He did not think carcinoma of the lung would be diagnosed in the X ray room, nor did he think the bronchoscopist could diagnose many of the early cases; these must be recognised by the general practitioner, who should be taught the early signs.

The PRESIDENT felt that this type of case was met with nowadays more frequently than could be accounted for by more precise methods of diagnosis. He did not think enough use was yet made of radiography, lipiodol, and bronchoscopy. He agreed that lobectomy was the method of choice for some of the small localised growths away from the hila, but unfortunately these growths were not recognised until secondary growths had occurred in the neighbourhood of the hila.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

AT the opening meeting of this Section on Nov. 5th the new President, Mr. CHARLES H. FAGGE, took the the chair and delivered an address on the

Aims and Limitations of Modern Surgery.

No one, he said, could have had charge of patients for 30 years, as he had, without occasionally asking himself whether his ideals had been achieved. Happy was the surgeon who could claim, as many no doubt could, that his aim was still to the infinities of the heavens. The philosophic surgeon, however, would confess that his ideal was still unaccomplished, for his aim was restoration to the normal, both as to organism and tissue. It seemed a pity that so much time and energy were taken up in attempting to prolong the life of patients suffering from terminal states, for whom the surgeon's efforts can do no more than leave them in a condition far from normal. Far too much

of modern surgery was mutilation. Excluding correction of injuries, such as fractures, and cosmetic operations, such as those for cleft palate and hare-lip, there was little in surgical technique which did not replace one evil by another. That fascinating field which sought to combat the ravages of age by transplanting an organ, or part of an organ, from an ape closely allied to man, or to replace a damaged or diseased organ by a similar organ taken from another human being, or to graft a finger where one had been missing, was still in its infancy. Much in this domain could not bear the test of results. Such transplantations could only succeed when the technique of connecting the blood-vessels and lymphatics of the transplated viscus to those of the host had been improved so far that the nutritive fluids could immediately be set going.

What, said Mr. Fagge, were the physical limitations placed in the surgeon's way? Apart from those engendered by the morbid state of the patient, there were the limitations resulting from the nature of bodily tissues and from the healing of every operation wound. There was, no doubt, truth in Lord Moynihan's remark that surgery as a craft had now reached finality, but it was not new; Erichsen had made it when Listerism first became firmly established. Even with the best technique and most accurate primary union a scar resulted. The width of a scar, though of no importance in coarser tissues, was an absolute bar to function in highly specialised glands, and blocked the transmission of impulses in any part of the nervous system. Modern aseptic technique had modified the amount of scar tissue formed by limiting the leucocytic infiltration, but if he was right in believing that proliferation of fixed connective tissue cells was the ultimate factor in causing fibrous tissue to form he could see no means of controlling it.

What happened, he asked, to any one of the higher connective tissues when it was subjected to an abnormal strain? In a patient who had undergone a radical cure by Bassini's method for inguinal hernia the appearance of the conjoined tendon was familiar. Normally, this formed a robust muscular upper border to the inguinal canal, which by its contraction was closed at the upper end, so forming a sphincter to the internal abdominal ring when the abdominal wall muscles were put into action. But when sutured down to the inguinal ligament one of two results ensued: either the stitches cut out or the mass of muscles degenerated to form a thin fibrous barrier. This might be a sufficient protection against recurrence, but its function was now no more than mechanical and its structure was greatly changed. Human tissues were intolerant of abnormal tension. A strain applied to soft parts usually resulted in suture material, whatever its nature or strength, cutting through; there was a giving way of the structure which it was intended to hold down, or a scar was formed by degeneration of the tissues held down. This limitation applied to many so-called pexies. In operations for incisional or ventral hernia where a scar area had been produced by infection, and the fibrous tissue over it offered but feeble resistance to normal abdominal tension, the surgeon's object was to replace the scar by normal resilient muscular layers. Much ingenuity had been expended in attempting to close this defect, yet most devices did no more than replace a thin weak scar by a thicker and more resistant one; such was the result of introducing metal filligrees or living suture material like fascia lata. Attention should be paid, Mr. Fagge suggested, not to the gap, but rather to the tissue which filled it, and to the free excision of all abnormal fibrous tissue in the scar. When this had been done, normal aponeurosis and normal muscle could be approximated, each to each, and the layers of the abdominal wall sutured one by one. He had not met with a case of incisional or ventral hernia which he could not close in this way with ordinary catgut sutures; they were all now following their ordinary occupations. An eccentricity of scar formation was traumatic keloid, but probably if this was freely excised it would not re-form.

DISCUSSION.

Mr. MAX PAGE thought the President was a little unjust to his department when he suggested that, with the exception of face-lifting and so forth, surgery was a mutilating procedure. In treating ventral hernia when a large gap was left his habit was to carry out a plastic operation, generally without the employment of any foreign material. He had attempted to get apposition of the main bulk of the abdominal wall by an overlap, such as was practised in the Mayo operation for umbilical hernia. Many cases during the war in which there was gross loss of tissue had been treated on these lines with good results. He was interested to hear that keloids could be excised and a good scar result; his own view had been that if a keloid was excised another appeared in its place. He would have liked to hear a reference to the treatment of infective processes; the older the surgeon the more he was inclined to leave infection alone and simply to avoid tension.

Mr. ZACHARY COPE suggested that the surgeon limited himself by the multiplication of specialties. But there could be no limit to surgery; if it was to live it must advance, and first of all in the direction of intelligent coöperation between surgeon and physician. Such advance might result in the avoidance of operation; in the next ten years, for instance, a medical cure might be found for exophthalmic goitre, which was a toxic process. Gastric ulcer also should be curable without operation. In some parts of the body the eradication of disease by radium left no scar which could be seen. Many keloids vanished under the influence of X rays; certainly they became softer.

Mr. A. J. WALTON agreed that the chief aim and object of the surgeon of the future would be the abolition of surgery. Practically all surgical operations were mutilating; he had always laid down a rule that as little normal tissue should be removed as possible. Mr. Cope was right in his reference to exophthalmic goitre; at present surgery was the only certain method of cure, but he could not envisage the surgeon being associated for long with such a mutilating operation. The continental method of removing half a stomach for a small ulcer was wrong in theory. In his own practice he found himself doing more medicine and less surgery. The surgery which approached nearest to the ideal, in restoring normal function, was the removal of benign tumours. Other instances were fractures and wounds of normal tissue, in which structure and function could be restored with the minimum of scar tissue. There was, he thought, no condition in which the surgeon felt so helpless as in infective processes. For himself he was coming to the view that extensive surgical procedures for the treatment of sepsis were wrong; it was now his custom to wait until the sepsis became localised and then to deal with the focus. He had seen in recent times far fewer instances of widespread operation for cellulitis.

Dr. N. L. LLOYD spoke of the variations sometimes seen in patients suffering from congenital abnormalities, such as children who had just escaped hare-lip.

All surgeons had seen cases of the kind in which nature had produced scars such as the surgeon strove in vain to emulate; why, he asked, was this so? Every face was, in fact, made up of a series of marvellously sutured seams. He had been struck by the occasional occurrence of keloid in an inguinal incision; his impression was that it occurred more frequently at the lower end of the hernial scar than at the upper, but it was a matter of conjecture whether that was due to encroaching on the area of the pubic hair, especially as in the case of children the growth of hair in that region was a matter for the future. He had excised keloids and seen them recur. The proper treatment of keloid was, he thought, to excise it and then apply radium. Some children seemed specially prone to keloid formation.

Mr. JULIAN TAYLOR said that any surgeon who had attempted to operate on a case of strangulated hernia between a filigree would hesitate to use this method. It was, he thought, very rare for a hernia of the abdomen to be due to a nerve injury; most abdominal injuries were within the linea semilunaris and the only muscle which could be paralysed was the rectus. It was a different matter in old war injuries, in which all the nerves in the area might have been destroyed, almost on their emergence from the lumbar spine.

Mr. HUGH LETT did not think that surgery was in such a bad way as had been inferred. In speaking of mutilating operations one had to consider on what kind of patients they were performed. A gall-bladder might be so hopelessly diseased as to result in a general poisoning of the patient; and if the surgeon could remove it and restore that patient to perfect health the "mutilation" was surely justified. Plastic surgery had brought about extraordinary improvements. Resection of parts of the bladder, and perhaps of the ureter, for deadly disease rendered patients practically as well as they were before. Had the title of the address been extended to include the aims and limitations of surgeons, as well as of surgery, an amusing as well as an interesting discussion might have ensued. He related the case of a man of 62 whose penis he had removed for carcinoma 14 years ago, and who was told to return in about three months to have the glands removed. He failed to do so, but returned recently because he had hydrocele. Limitations were sometimes imposed on the surgeon by the patient, who might, as in this instance, score heavily.

REPLY.

The PRESIDENT remarked that each surgeon must find out his own limitations; he should learn what he could and what he could not do. It was surely better to do an operation he knew he could accomplish than another which someone else had advised. Acute infections he did not regard as part of his text. He had never had to deal with a hernia due to paralysis of muscle. In cases of abdominal hernia he relied on spinal anæsthesia.

UNITED SERVICES SECTION.

AT a meeting of this Section, held on Nov. 10th, Surgeon Captain S. F. DUDLEY, the President, took the chair, and Group Captain MARTIN FLACK read a paper on

Air-sickness and Sea-sickness.

He said that air-sickness and sea-sickness had certain factors in common, and differed in the relative importance of these factors. The data concerning air-sickness were based largely on opinion, and statistics were still badly needed. Nevertheless, he had come to the conclusion that the great cause of air-sickness—apart from anticipatory anxiety, which was difficult to estimate—was defective ventilation. Pilots who had never been sick in open machines suffered as soon as they flew in cabin machines. The problem of ventilation was very troublesome. An aeroplane ventilated from back to front, and the cabin tended to be stuffy in some parts and cold in others. An open window did not cool the person who opened it, but made a draught on the back of the neck of the person sitting immediately in front. If a passenger vomited in front, those behind all saw his sufferings; if he vomited at the back the smell was conveyed all through the cabin. It was important that the foot level be warmer than the head level, or the passengers would feel stuffiness. Research was being undertaken with the katathermometer, and it was hoped that this work would soon bear fruit.

The factor of undue stimulation or supersensitiveness of the vestibular apparatus weighed less in the air than at sea, for the air was smoother and the amount of disturbance to the semicircular canal smaller. Persons who were sea-sick were not necessarily air-sick; if this fact could be brought to the public notice it would lessen the importance of anticipatory anxiety, and popularise flying. The lack of agreement between visual, labyrinthine, and deep muscle sensations was important in the air, and to reduce it passengers must have a wide view of the horizon through good windows. This was one of the chief reasons why the high-wing monoplane was one of the most comfortable machines in which to travel; the passenger's view was not intermittently interrupted by moving struts and wires. It was also necessary to increase the amenities within the cabin. Vomit receptacles must be hidden from the public eye, and the passenger's interest directed to booklets or maps rather than to ominous paper bags or the agonies of their fellows. Persons handicapped by supersensitiveness of the semicircular canals were eliminated from among would-be pilots by their reaction to rotation in a chair. Those liable to become dizzy in the air had a marked rise of blood pressure and disturbance of ocular muscle balance, although their nystagmus time might be normal. Another group who complained of giddiness actually tended to faint; they manifested a fall in diastolic pressure. Candidates who suffered from anticipatory anxiety showed a rise in blood pressure when placed in the chair, even before it began to rotate.

SEA-SICKNESS.

Group Captain Flack described the results of tests which he had carried out in liners. There was a small group of passengers who had a supersensitive labyrinth and who would be sea-sick at any uneven movement. The mechanism seemed to be merely a stimulation of the vagus, which caused contraction of the stomach and vomiting. In most sufferers some additional factor was necessary. The sensory dilemma played an important part: people did not like their eyes to tell them that the ship was coming down while their labyrinth told them that it was going up and the deep muscles gave them some other information. Persons who had acquired their "sea-legs" tended to correct the dilemma by a movement of the head. This factor was probably aggravated by the induction or increase of ocular muscle imbalance. Members of a crew who had never been sick for 20 years or more had all been found to possess good ocular muscle balance.

Imbalance was measured by the Bishop Harman diaphragm, and tests had shown that it was increased during the period of nausea, whether the eyes were open or shut. It might be an effect of the uneven movement and not a cause; it was brought about by reflex action from the semicircular canals and the eye or neck muscles. One of the symptoms was disinclination to continue reading.

Physical factors, such as stuffiness and smells, were undoubtedly important to a number of people, especially when combined with anticipatory nervous anxiety. The general health and time of exposure also played their part. The phenomena of acidosis and acetonuria required investigation, and it was necessary to differentiate between the afferent stimuli and the resulting impulses. These changes in the blood chemistry were an effect and not a cause. Some persons who suffered from severe sea-sickness were really in a state of semi-starvation. Many persons, even if they had no tendency to dyspepsia, were not in a fit state to withstand uneven movement, especially those who had drunk too much alcohol the night before. The effects of sea-sickness might be confused with those of alcohol. Poverty of abdominal tone might predispose, and some patients —especially those with slack abdominal walls— staved off sickness by wearing abdominal belts.

In conclusion, Group Captain Flack said that each case needed close examination before the right treatment could be prescribed. A "blunderbuss" must contain a drug which would prevent the afferent impulses from reaching the centres; a large dose of alkali might be useful, and the mixture might be made palatable with sugar.

The PRESIDENT suggested that the ventilation problem in aeroplanes might be solved by mechanical ventilation. In his experience, a fit and athletic man with plenty of tone was less likely to be sea-sick than a person of inferior physique. Alcoholic excess was not important; alcohol actually relieved the condition, either by inhibiting stimuli or by destroying the sense of position in space and of movement of the ship.

Surgeon Vice-Admiral ARTHUR GASKELL remarked that some persons obtained protection from sea-sickness by tying a horse's girth tightly round the waist. He asked whether ocular muscle imbalance was not purely a concomitant of vomiting.

AN ŒSOPHAGEAL FACTOR.

Dr. E. P. POULTON doubted whether the labyrinth was as important as Group Captain Flack suggested. Stimulation of the labyrinth ought to cause nystagmus, but this had never been observed by G. H. Oriel. The connexion of the labyrinth with sea-sickness had been supposed from the phenomenon of Ménière's disease, but the most striking symptom of this was vertigo, of which few sea-sick persons complained. From observations he had made on a student he had discovered that nausea was associated with an extreme relaxation of the œsophagus; he suggested that it was identical with, or preliminary to, œsophageal pain. In ordinary contraction of the muscle the tone took pressure off the end-organs, but when tone was relaxed the pressure reached them. Swing tests had shown that nausea was felt either just before or just after the dead centre on each side—i.e., on a movement tending to elongate the œsophagus. It was considerably less severe after dinner. This theory explained the relief the patient felt when he lay down, and the greater severity of a pitch than a roll. Nausea was not the only effect; he had himself felt a tightness in the head, and suggested that congestion of cerebro-spinal fluid upwards might be considered in this connexion. He agreed that the chemical changes were secondary.

Wing Commander F. N. SMARTT complained that Group Captain Flack had dealt chiefly with secondary causes. He did not agree that stuffiness was a basic cause of air-sickness; bumping would cause sickness whatever the conditions of ventilation. Sickness in the air or at sea was due to a splanchnic defect, which caused a definite sensation of loss of equilibrium. This might possibly be felt through the eyes, semicircular canals, or splanchnic area. An air pilot was only made sick by severe bumping, this being the one sensation which he could not anticipate. The spinning test was imperfect, for it involved no disturbance of equilibrium. Movements which induced nystagmus would hardly ever induce sickness in persons who had no splanchnic defect. Vibrational noise was an important contributory cause in the air.

Dr. HUGH STANNUS suggested that the sickness of sea and air was identical with that of a stuffy room, and that the effect on the semicircular canals was not necessarily a primary factor. He asked whether Group Captain Flack had noticed any signs of a diathesis in the histories of his subjects, and whether, acetonuria might not be the result of anticipation. Sea-sickness was often associated with diarrhœa.

Surgeon Commander G. H. HAYES differentiated between patients who recovered immediately and those who were prostrated; he asked the reason for the difference between these types.

Fleet Surgeon W. E. HOME did not regard ocular muscle imbalance as very important; he himself possessed only monocular vision, but was often sick. If sea-sickness were due to splanchnic imbalance patients would not become immune so quickly.

Group Captain FLACK briefly replied.

SECTION OF PSYCHIATRY.

AT a meeting of this Section, held on Nov. 11th Dr. S. A. KINNIER WILSON delivered his presidential address on the

Approach to the Study of Hysteria.

Hysteria, he said, had not yet yielded its secret. The period of psychological study had been marked by a lack of objective and empirical research. The outstanding feature of hysteria was, perhaps, the changes which its clinical syndromes had undergone. Religious stigmata and impersonations of great actresses were out of date; as was the simulated spinal disease which had been outstanding in the early part of the eighteenth century. The phases had corresponded with contemporary medical predilections; the hysteric had done her best to adapt to the calls made on her. To-day we sought the clue in the psyche, and the hysteric found her somatic manifestations at a discount. Nevertheless, the kaleidoscopic patterns of hysteria were composed of unaltering instinctive and impulsive reactions, and an earthquake or a world war would lay bare manifestations resembling the classical ones. Hysteria might be but a name for a reaction, capable of being expressed in dynamic neurophysiological terms. How were the disturbances of function actually brought into being? Could anything be learnt of the seat of the functional defect? Organic disease would teach more about hysteria than vice versa. Physiological investigation needed no apology, but few psychologists had pursued it.

CLINICAL FEATURES OF HYSTERIA.

Defective inhibition of the antagonists was a pathognomonic sign of the utmost value. A paraplegic asked to extend the legs would first show contraction of the hamstrings. This was a disorder of the Sherringtonian law of reciprocal innervation. In the "organic" condition of athetosis and in some frontal lobe conditions a similar derangement of this law might be seen, and the conclusion was, therefore, that hysterical palsies bore the physiological imprint of cortical defect of function. Another valuable sign was the "shunting sign," in which the innervation was shunted to another group. If the patient was asked to grip a finger the grip was absurdly weak, but the biceps or deltoid might be in powerful contraction. This also might be found in some organic conditions. Both could be imitated voluntarily, but this did not therefore indicate simulation. "Voluntary" detonisation might proceed so far as to cause loss of knee-jerks, and a fair reproduction of Jacksonian epilepsy could also be given "voluntarily." The criterion of imitational capability was worth nothing. The point was that imitability characterised motor phenomena, of which the seat was cortical. Both "shunting" and "antagonist contraction" signs indicated impairment of cortical function coupled with defective inhibition.

Hysterical tremor presented no distinctive features from those of "organic" tremors; typical "intention tremor" was seen in hysterical cases, and "organic" tremors were affected by numerous psychic factors sometimes supposed to affect hysterical tremors only. Fluidity of organic tremors was so pronounced as to render any such distinction valueless. Patients with hysterical tremors were supposed to suffer less from fatigue than normal persons imitating tremors, but as long as the tremor was kept up, it might be indistinguishable from an "organic" one. In hysteria, as in organic states, tremor was an escape phenomenon of an infracortical level.

Hysterical fits, ranging from fugues to immobility, were hard to synthesise, but were one and all escapes from conscious control. Clinical differences between hysterical and other convulsions stood for modifications in site and extent, but not for intrinsically different processes. The hysteric might simulate decerebrate rigidity. If the hysterical process removed the action of the cortex it was hard to see how the patient could adopt any other attitude. The anæsthesias of hysteria were supposed to correspond with psychological and not with physiological disposition, but in syringomyelia there might be glove and stocking anæsthesia; in parietal lobe lesions there might be sensory changes in hand and leg, and "organic" disease might involve loss of sensibility over the front of the body and not over the back. These types, therefore, were not specific for hysteria. Absence of bleeding on pin-prick had been seen in thrombosis of the cerebellar vessels. Bulbar centres and mechanisms might thus be involved in hysteria.

Reflectivity was often abnormal in hysteria; the plantar response might be lost, the abdominal reflex weakened or lost, and ankle-clonus or sphincteric trouble might be found. These phenomena must bear the same interpretation as in "organic" lesions.

CONCLUSION.

Cortical, infracortical, mesencephalic bulbar, spinal, and neurosympathetic mechanisms might be disordered in function as a result of processes called hysterical. Differentiating criteria between "organic" and "hysterial" conditions had lost much of their specificity. In one of its respects, at least, the condition became less mysterious when its processes could be traced through various physiological levels. The terms of opposites "organic" and "functional," "structural" and "nutritional," should be abandoned, but "dynamic" and "static" could be used. Hysteria showed a prominence of dynamic and a comparative absence of static elements. Rapid cure was to be explained on the hypothesis that function was abrogated dynamically and not statically. A strictly sexual ætiology was not universally applicable. On the view that hysterical manifestations were simply reactions to stimuli it was still hard to understand why these restricted stimuli should be capable of causing responses varying from fugue to retention of urine. There was a glaring hiatus. Emotional states could be taken as exciting if not predisposing causes, but individual hysterical reactions were not easily correlated with such a general excitant as emotion. In many cases it seemed impossible to associate the part of the body affected with some emotional incident. The hysteric was born and not made. The determinant might be really physiological and not psychological; an inherent liability of reaction, a lack of neuronic cohesion, an abnormal facility of dissociation of neural systems. The physiological basis of the will might be inhibition—a "letting go," rather than a "doing"—the essence of the voluntary act. Failure of transcortical control would then explain the phenomena of hysteria. The present trend was to reduce the number of functions once ascribed to volition, and much cortical activity was now regarded as reflex in nature. The cortex could only differ from the other ganglia in its complexity. An approach from below upwards had much to commend it; the gap between physiological and psychological was not likely to be bridged from the psychical side.

AN AMERICAN "PENNY-IN-THE-POUND" SCHEME. The town of Bedford, Massachusetts, has adopted a contributory scheme on the model of that at Sheffield.

POSITION OF KING'S COLLEGE HOSPITAL.—Dr. Claud P. Serocold, the treasurer, states that "King's College Hospital is in dire straits and can no longer struggle to maintain its precarious foothold against financial difficulties," and that in default of adequate support many wards must be closed. The cost of maintenance exceeds £100,000, and the ordinary income fails to meet it by £18,000. This year securities to the value of £14,500 have been sold, and those that remain are insufficient to meet outstanding accounts amounting to £15,000. An increased income of not less than £20,000 is needed to maintain the work unimpaired. Ten years ago seven wards had to be closed, but "by extraordinary efforts" they were eventually reopened.

JOHANNESBURG HOSPITAL: MAINTENANCE APPEAL. An appeal is about to be made to South Africans in London on behalf of the Johannesburg Hospital, which claims to be the largest institution for the care of the sick in the British Empire, with 1141 beds distributed among the General Hospital (530 beds), the Non-European Hospital (203), the Transvaal Hospital for Children (133), the City Fever Hospital (90), the Otto Beit Convalescent Home (52), and the Queen Victoria Hospital (43). To the institution is attached the medical school of the Witwatersrand University and a training school for nurses. Last year there were 18,400 in-patients, and 157,000 attendances at the casualty and out-patient departments. The cost of maintenance is £236,500. The Government gives a subsidy of 72 per cent. of expenditure; 24 per cent. comes from patients' fees and other revenue; the public contribute the remaining 4 per cent. Costs have, however, mounted so rapidly that the Government has been compelled to call a halt, and an appeal for more money has therefore become necessary.

THE VISIT OF PROF. CHEVALIER JACKSON.

THE medical profession has had the pleasure of welcoming in London during the past week Prof. Chevalier Jackson, of Philadelphia, whose developments of tracheal and bronchial surgery have for a long time made his name familiar to all our readers.

A Welcome from the Section of Laryngology, R.S.M.

The Section of Laryngology of the Royal Society of Medicine made out an inclusive programme to mark the event.

On Thursday, Nov. 6th, the Section met for a demonstration in colours of plastic operations by Prof. J. Eastman Sheehan, of New York, when Sir Harold Gillies and Mr. Lionel Colledge showed cases illustrating the end-result of such surgical procedures as the excision of costal cartilage for use in facial repairs, the utilisation of skin grafts of full thickness in lupus, and of epidermic grafts in cicatricial contracture of the hand. In the evening an At Home was given by Sir StClair Thomson to meet Prof. Chevalier Jackson and Mr. V. E. Negus, who had delivered the Semon lecture that afternoon (see p. 1086). There was a very large attendance.

On Friday, the 7th, the subject of precancerous conditions in general was reviewed by Prof. Chevalier Jackson in a debate before the Section. He submitted that a knowledge of precancerous conditions would solve many problems of ætiology, and a debate ensued on the general question whether the existence of a precancerous condition had as yet been proved. To that debate Sir StClair Thomson, Mr. Lionel Colledge, Dr. E. D. Davis, Mr. Herbert Tilley, Dr. J. A. Gibb, and Mr. E. Musgrave Woodman contributed, while interesting cases were shown by Mr. W. Stewart, Mr. L. Graham Brown, and others.

A Complimentary Dinner.

A dinner was given on Friday evening, at the Langham Hotel, by the Section of Laryngology in honour of Prof. Chevalier Jackson, when Mr. F. A. Rose, President of the Section, presided over a large company of well-known specialists and representative guests. Mr. Rose proposed the health of Prof. Chevalier Jackson in happy terms. Reminding the audience that Dr. Johnson had said that to praise a man in front of himself was always indelicate and often offensive, he refused to enlarge upon their guest's well-known work, either upon his surgical achievements in carcinoma of the larynx or his famous exploits with the bronchoscope. He aptly compared Prof. Chevalier Jackson with Elias Howe, who invented the sewing-machine—"Howe showed the world that the eye of a needle should be at its point, and Jackson taught the medical world that the light of the bronchoscope should be placed at its tip." It was not for the surgical work and certainly not for the modest manner in which he suppressed his personality, but for his marvellous dexterity with the instrument which he had invented that their guest would be remembered. The toast was supported by Mr. Herbert Tilley, who told Prof. Jackson that, whether the statement was indelicate or offensive, he, as their guest, was surrounded by hero-worshippers.

Prof. Chevalier Jackson, in reply, said that the overwhelming reception which he had received had surprised him. He had been asked what qualities went to the making of a successful bronchoscopist, and he concluded that a man to reach the position must pass endless time in making experiments, many of which led nowhere, and in writing much that no one would read; the successful bronchoscopist was, in fact, a natural born fool. He gave an amusing illustration of his methods, when he described a fishing holiday on which he went, with two doctors who could not fish, to a river where there were no fish. He, for his part, took a small working outfit with him, and spent his time extracting fishhooks embedded in various ways in rubber tubes. He was considered by the mill-keeper, in whose mill the party had lodgings, to be mad, a view which was afterwards reversed, Prof. Jackson being found by the mill-keeper to be, "like myself, a man of high intelligence." The change of opinion was due to the fact that a large foreign body having fallen into the machinery of the mill, the mill-keeper commenced taking down the whole building. Whereupon Prof. Jackson rigged up, on bronchoscopy lines, some appropriate tackle, and extracted the foreign body as though the shaft of the mill were a larynx. Prof. Jackson said that the pleasure of the occasion was for him tinged with sadness for one reason—his father, born in Hull a century ago, could never know the events of the week.

The toast of the guests, other than the guest of the evening, was proposed by Dr. Dan McKenzie, who compared one kind of eloquence to sunshine that illumines the landscape and yet draws no attention to itself, and another kind of eloquence to moonshine that fills us with the sense of its own loveliness, but leaves the landscape hazy. A third kind, he suggested, was represented by the action of Swiss hotel-keepers who insult the majesty of the snowy peaks of the Bernese Oberland by throwing nightly searchlights upon them. As these men are unworthy of the beauty they live in so was he, he feared, unworthy of the task confided to him. He coupled the toast with the names of Sir Humphry Rolleston and Dr. Watts Eden. Mr. Alex. R. Tweedie briefly supported the toast, to which both distinguished guests responded.

Sir StClair Thomson proposed the health of the chairman, with whom he had had the pleasure of travelling on several occasions. He took the opportunity of insisting, for the benefit especially of the younger members of the company, on the enormous value of travel on the Continent and in the great transatlantic countries, while he congratulated Mr. Rose upon the successful commencement of his year of office.

On Monday evening Prof. Chevalier Jackson introduced a discussion on the Diagnosis and Treatment of Malignant Disease of the Chest, at the Medical Society of London; this is reported in another column.

DISTRICT BEDS FOR HOSPITALS.—In the summer of last year Dr. W. Lee suggested that the two Cheshire villages of Bredbury and Romiley should make a concerted effort to endow a bed at Stockport Infirmary and another at St. Mary's Hospital for Women and Children at Manchester, the total sum required being £2000. The population of the two villages is 10,000. The money was raised so easily that it was decided to increase the effort and to add a bed at the Manchester Royal Infirmary, and a cot at the Children's Hospital, Pendlebury, at a cost of £1500 for the two. The "campaign" has just ended with a bazaar which has brought up the total amount raised to £6500. The unexpended balance is to be used for further extensions of the scheme.

REVIEWS AND NOTICES OF BOOKS

Cancer of the Lung
and Other Intrathoracic Tumours.

By MAURICE DAVIDSON, M.A., M.D., Physician to the Brompton Hospital for Consumption and Diseases of the Chest, and Dean of the Brompton Hospital Medical School. Bristol: John Wright and Sons, Ltd.; London: Simpkin, Marshall, Ltd. 1930. Pp. 173. 17*s.* 6*d.*

THE literature of intrathoracic tumours has increased rapidly during the last decade. Dr. Davidson's book is based on the findings in a number of cases which have been treated in the Brompton Hospital. Short clinical notes and histories of 22 cases of intrathoracic tumour are given. Unfortunately, in three of the cases recorded, no post-mortem examination was made, and in about half of them no histological data are furnished, so that the exact nature of the tumours in these cases is uncertain. The clinical part of the work should be of much value. It is brief, concise, and very readable. Apart from the implication made that intrathoracic tumours are not especially characterised by pain, the author's findings are generally in accordance with those of other writers. Valuable information is given on diagnostic methods, such as lipiodol injections and bronchoscopy, and a helpful note on radiological technique is supplied by Dr. Stanley Melville. The section on pathology is somewhat sketchy. The discussion is confined practically entirely to problems of bronchial carcinoma; lymphosarcoma of the mediastinal glands is mentioned only to be dismissed as a condition for which bronchial carcinoma used, in the past, to be mistaken. The cases described, however, have not been limited to those of carcinoma of the bronchus; in Case 4 and Case 22 there appears to have been no bronchial or lung involvement; one of these was cited as a thymoma. In a separate section of the book certain non-malignant tumours, including dermoids and hydatid cysts of the mediastinum, are considered.

The Child's Conception of Causality.

By J. PIAGET, Professor at the University of Geneva. Pp. 309. 12*s.* 6*d.*

The Laws of Feeling.

By F. PAULHAN, Academie des Sciences Morales. Translated by C. K. OGDEN, M.A. Pp. 208. 10*s.* 6*d.* Both volumes published by Kegan Paul, Trench, Trübner and Co., Ltd., London. International Library of Psychology and Scientific Method. 1930.

THE first of these two books takes a stage further Prof. Jean Piaget's investigation of the child's world. The research is conducted in the familiar questionaire form made known to all readers of the author's early volume. The child, according to the author, starts with a view of the world which is essentially animistic. At first the lack of distinction between an inner and outer makes the world participate in the child's mental activities, and for some time the world interlocks organically with the processes of mind. During the period of severance, however, the mind still clings to this outer order, giving it consciousness, and causing it to retain some of the human attributes. According to the author's researches, this animism is reluctantly given up, and gives to subsequent ideas of causal relationship an "agency" which, even in philosophic thought, is not entirely relinquished. Five varieties of such "adherences" of subjective factors to the view of the external world have been described by Prof. Piaget—ranging from the early magical belief, through artificialism and thence to the idea of force—i.e., that things make efforts—analogous to muscular force. The transition to simple realism is achieved when the child appreciates its own subjectivity. But even then there is an absoluteness in its idea of substance in the passage to relativity and reciprocity. The development of causality in the child takes place along the same lines as does the construction of an external world of related parts, each and all related to the observant mind.

Prof. Piaget's conclusions from his interrogatories may not satisfy certain critics as to the animism of the child. It savours of the French anthropologists who separate categorically a primitive prelogical from a developed logical form of thought. However this may be, his studies are stimulating to thought, and, above all, to further researches in the same field.

Students of instinct and emotion, particularly in England, have been captivated by the exposition of Prof. McDougall in his Social Psychology. Some have eventually grown restless over his catalogue of instincts and their accompanying emotions, yet have felt unable to formulate trenchantly a counter theory which would be as comprehensive, as easy to handle, and yet conform as well and even better with the facts of psychology. Paulhan's essay on the Laws of Feeling, now accessible in English, brings forward a powerful thesis which not only allays much of the dissatisfaction felt over McDougall's standpoint but compensates for many of the shortcomings in psychology that created a hiatus between it and neurobiology. His thesis—that feeling and emotion are the result of arrested tendencies—will find many adherents in the apparently separated realms of biology and psychopathology. Such a theory is much more dynamic than any theories that have gone before, and fits the moving facts of life better than does an academically static catalogue. The author argues his thesis with abundant examples, acute insight, and the usual Gallic clarity and devotion to logic. The addition of a later essay on Feeling, Will and Intelligence concludes an important volume which should not be missed by students of psychopathology.

Röntgenuntersuchungen am Innenrelief des Verdauungskanals.

By Dr. HANS HEINRICH BERG, Professor at the University of Berlin; Senior Physician at the Charité University Clinic. Leipzig: Georg Thieme. 1930. Pp. 198. M.29.

THE X ray study of mucous membranes originated with Forssell of Stockholm, who, in a number of papers, drew attention to the fact that the radiologist may obtain much information about the lining membranes of the alimentary tract if suitable methods are employed. Prof. Berg has already made several important contributions to the subject, and this book is an expansion of his previous work. A few minor modifications of the ordinary opaque meal technique bring to the service of the radiologist the means of studying the living mucous membrane. Many of the

workers who employ the combined screening and palpation method for opaque meal investigations have for years past used the manipulation of the first mouthful as it reached the stomach for the demonstration of the folds of the mucous membrane. Berg has elaborated this technique in various ways, and extended it to the intestinal mucosa with most telling results, and it is not easy to over-estimate the diagnostic possibilities that are thus foreshadowed.

An extraordinary wealth of detail is revealed by the arduous technique. So trying is it, that seemingly no observer can undertake more than six cases in a day, the intensive palpation and manipulation being so exhausting. In the present state of our knowledge, detail obtained by these advanced methods is perhaps an embarrassment, for it complicates the problems of the diagnostician. The nearer we approach to the borderland where pathology and normality meet, the larger the number of borderland cases and the more difficult it is to differentiate. A thorough understanding of the possible variations of the normal becomes more and more essential for accurate diagnosis. These painstaking studies will be the basis on which Dr. Berg and other investigators will assuredly build up an entirely new conception of the normal and abnormal mucous membrane.

The book is illustrated by numerous radiograms and photographs of pathological specimens. All the illustrations are of a very high order of technical excellence.

An Hour on Health.

By MORRIS FISHBEIN, M.D., Editor of the *Journal of the American Medical Association*. London: J. B. Lippincott Company. Pp. 158. 4*s*. 6*d*.

THIS is a very readable little manual on healthy living, written obviously for the American business man, and the advice which is given him about his diet, rest, golf, and other recreations is both sound common sense and good physiology. The style is crisply American, and there are some amusing passages, more especially in the chapter on food fads and fallacies. The author has little patience with vegetarians, white bread fanatics, and cold bath enthusiasts. The Americans, he tells us, are a constipated people, but because of, or in spite of, this, "five generations of them, fed on meat and potatoes, develop sufficient stamina to contribute largely towards winning the World War." The prevention of heart disease is dealt with vaguely, and contains no reference to the method of direct attack on the incipient disease which has given such encouraging results in this country where, incidentally, the view accepted by the author that chronic tonsillar sepsis is a prime factor in the ætiology of juvenile rheumatism has not been substantiated. The last chapter, entitled Medicine in our Changing World, sets out the author's own views on various medico-political questions of the day. From many of these the English reader will dissent. With the truism that "the sick human being demands individualisation" the counter-advantages of team-work in the alleviation of human ills are rather lightly dismissed. In this chapter Dr. Fishbein lets his fancy have free play, and if his approach is not strictly scientific it is always interesting.

Journal of Pathology and Bacteriology.[1]

THE importance of venous invasion in the development of metastatic tumours in the liver, by R. A. Willis (Melbourne). The primary metastases invade the portal veins and so produce secondary crops.—*Spirillum minus* derived from a spontaneous infection in the mouse, by J. A. W. McCluskie (Glasgow). The strain was not pathogenic for guinea-pigs or man and may not be identical with the similar organism in rats which causes rat-bite fever.—Bacteriæmia following operations on the urethra, by F. J. F. Barrington and H. D. Wright (London). After the passage of bougies in an infected urinary tract, bacteria often invade the blood stream at once and soon disappear; malaise and rigors appear when the blood is sterile (see p. 1087).—The pharmacological action of the exotoxin of *Staphylococcus aureus*, by C. H. Kellaway, F. M. Burnet, and F. E. Williams (Melbourne). The main effect is a large fall of blood pressure, due partly to obstruction of the circulation through the lungs, and partly to a direct action on the myocardium.—The reactions of the cells in pleural effusions to supravital neutral red, by R. A. Hickling (London). Endothelial cells are by this method clearly distinguished from monocytes.—Reactions of the human skin to horse serum, by C. E. Kellett and H. D. Wright (London). The intracutaneous injection of horse serum in normal persons may be followed a few days later by a series of urticarial whealings which are presumably analogous to serum sickness.—The effect of immunisation upon temperature response in rabbits, by H. D. Wright (London). Vaccination reduces but does not abolish the fever which follows the inoculation of the dead homologous organism.—The staining of calcium, by G. R. Cameron (London). Neither hæmatoxylin nor silver nitrate is a reliable reagent for the microscopic detection of calcium salts; alizarin is nearly specific but not altogether easy to apply in practice. It stains recent deposits much better than old ones.—The pathological changes found in a fatal case of psittacosis, by G. H. Wilson (Birmingham). The consolidation of the lung is lobar with abundant fibrin formation, but there is no reaction by the polynuclear leucocytes and the bronchioles are not specially involved.—Isohæmagglutinins: the influence of the fœtus upon the titre of the mother's blood during pregnancy, by Kathleen Edgecombe (Liverpool). If the fœtus is of a different blood group from the mother, there is a considerable rise in the effective agglutinins in the mother's blood during pregnancy which disappears after childbirth. With a fœtus of the same or no group, little or no change occurs.—Anaphylactic responses of the guinea-pig's skin, by C. E. Kellett (London). Contrary to the usual experience, it is possible to produce serum sickness in a guinea-pig.—Schilder's encephalitis periaxialis diffusa in a rhesus monkey, by J. R. Perdrau (London).—Persistent eosinophilia, by A. M. Drennan and J. H. Biggart (Belfast). A case of leukæmia with considerable nodular deposits in which the neoplastic cells were sufficiently differentiated to appear as normal eosinophil leucocytes.—The pathological action of light: the repair of necrosed tissue, by A. G. Levy (London). A smaller dose of destructive stimuli causes considerable epithelial proliferation.—A case of tuberculosis of the stomach, by E. R. Cullinan (London). A boggy lesion at the cardiac end full of acid-fast bacilli; the lungs showed general miliary tuberculosis.—The influence of liver extract effective in pernicious anæmia upon the diameter of erythrocytes in experimental anæmias, by G. P. Wright and B. Arthur (Boston). Liver extract has no effect on the blood of normal rabbits, nor does it assist the cure of experimental anæmias caused by bleeding or phenylhydrazine. It, however, reduces the severity of phenylhydrazine anæmia. It is suggested that liver extract cures pernicious anæmia by promoting the orderly degeneration of the megaloblastic phase of the erythropoietic cycle.—Sacral chordoma with widespread metastases, by R. A. Willis (Melbourne). Secondary growths were found in lungs, heart, liver, spleen, kidneys, thyroid, and skin, and a number of bony exostoses were also present.—The influence

[1] Vol. xxxiii., No. 4, pp. 849–1174, October, 1930.

of testicular extract on dermal permeability and virus response, by D. McClean (London). Testicular extract improves the taking capacity of some strains of vaccine virus; it enables the inoculum to spread out among the cells more quickly after insertion.—Necrotic sequestration of the kidneys in pregnancy (symmetrical cortical necrosis), by W. de M. Scriver and H. Oertel (Montreal). Two cases confirmed post mortem and one which recovered.—Coal-miners' lung, by S. L. Cummins and A. F. Sladden (Cardiff and Swansea). A full account with many chemical analyses of lungs. Coal dust becomes important if it has been preceded or is accompanied by silica dust, which blocks the lymphatics and allows the coal dust to accumulate. Serious anthracosis always shows an abnormal amount of silica in the lung.—A further contribution to the pathogenesis is experimental poliomyelitis: inoculation into the sciatic nerve, by E. W. Hurst (London). The virus spreads along the axons; the cerebro-spinal fluid is relatively unimportant. After sciatic inoculation the virus can be found in the corresponding motor cortex before it can be detected in the cervical cord.—The types of tubercle bacilli occurring in the sputum of phthisical persons, by A. S. Griffith (Cambridge). Fully tested and verified bovine bacilli have been found in the sputum of cases of phthisis in England in 3 cases out of 327 examined, in Scotland in 18 out of 468. In two bovine bacilli were also obtained from the lungs at autopsy.—Direct platelet counting, by H. K. Goadby (London). He uses paraffin-lined pipettes.—Individuality in the size of red cells, by C. Price-Jones (London). Each person has a characteristic mean diameter of red cell which is maintained over long periods.

PANEL AND CONTRACT PRACTICE

London Public Medical Service.

The Public Medical Service for London came into being in the spring of 1926, when rules were framed by the members of the London Panel Committee, the British Medical Association, and the Medical Practitioners' Union, who were instrumental in its inception. Its main ideal was to provide medical attendance and medicine by a contributory scheme for persons unable to pay the usual medical charges in the ordinary way, the income limit being fixed at the same figure as that under the National Health Insurance Acts—namely, £250 per annum. At the same time it was agreed that the practitioners who implemented the service should receive adequate remuneration. With these points in mind the weekly payment of a subscriber was fixed at 3*d.*, an entrance fee of 1*s.* and a quarterly levy of 9*d.* being charged to cover the cost of administration. In this way a practitioner was to receive 13*s.* per annum for each subscriber, out of which medicine had to be provided. The average cost of medicine per subscriber per annum is computed at 2*s.* Recently a flat rate of payment has been introduced in the Kensington and Paddington areas, where the local committees found that the separate payment of a quarterly levy was irksome. In these areas the rate for a single subscriber is 4*d.* (the doctor reserving the right to charge 6*d.* a week if the risk of sickness seems likely to be above the average), for two in family 8*d.*, for three 11*d.*, for four or more 1*s.* 1*d.*, the entrance fee being 1*s.* for one subscriber and 2*s.* for two or more. A percentage deduction is made for administration in the areas where the flat rate operates.

The service was inaugurated at a series of local meetings in the various London boroughs, and by the end of 1926 the subscribers numbered a little over 5000. Since then progress, though not realising the expectations of the management committee, has been steady. The latest figures are as follows:—

Number of practitioners working the Service	402
Number of honorary members (i.e., practitioners not working the Service but who are in agreement with its principles and wish to be associated with it) ..	110
Number of subscribers	11,461

Although 11,461 subscribers may not seem a large number for an area like London, it should be remembered that the service was inaugurated just when the disastrous strike of 1926 occurred. Another source of loss has been the removal of working-class population from the Metropolis to London County Council estates which are outside the area of the service. Deaths, removals, discontinuance of subscriptions owing to unemployment, subscribers becoming eligible for treatment under the National Health Insurance Acts, all contribute to limit the total number of subscribers. The main difficulty has been in making the public aware of the existence of the service. The restriction on public announcement is felt to be somewhat hard on a movement which is endeavouring to do its share in assisting the community towards the goal of better health. Signs are not lacking, however, that the public is beginning to realise the existence of the service; subscribers are now coming in at the rate of 100 a month, and an increasing number of inquiries are being received at the head office, 17, Russell-square, W.C. 1.

The Patient who goes to a Bonesetter.

"If an insured person," we have been asked, "with an injury to the shoulder, fails to keep an appointment made by her panel doctor to see a surgeon in a neighbouring town, but goes instead to an unqualified bonesetter and continues to go to him for treatment, is the panel doctor justified (1) ethically, (2) under his terms of service, in refusing (*a*) to treat her, should she subsequently apply to him for treatment, (*b*) to give weekly certificates of incapacity for work, should she apply for them?"

Answer.—1. Ethically the panel doctor is quite justified in refusing both treatment and service.

2. (*a*) Under his terms of service it is open to argument that the refusal might constitute a breach of contract with the insurance committee. The insured person has been guaranteed medical benefit, and if she applies for treatment it is difficult for the practitioner to refuse. She has, however, made it difficult, if not impossible, for him to render the proper treatment if she puts herself into the hands of an unqualified person. The proper course would be to report the facts to the insurance committee, in order to protect himself from their criticism and subsequent action.

2. (*b*) With regard to sickness benefit the panel doctor has to deal with the approved society of which his patient is a member. Supposing that the action of the insured person is not conducive to speedy recovery, he should withhold certificates and report the matter to the society, which may refuse benefit to a member found guilty of infringing the benefit rules. Moreover, as a general rule, the practitioner should not give certificates where he is not rendering the treatment himself. Before being in a position to certify, he has to make a complete examination, and difficulties will arise unless he is making this examination as a preliminary to advice and treatment.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 15, 1930.

INTERNATIONAL MEDICINE.

THE League of Nations has now reported upon its work during the first ten years of its existence,[1] and the record sets forth briefly and impartially both the progress which has been accomplished and the methods which have been devised for dealing with international problems as they arose. The League represents aspirations that have been set before the world for some 200 years, but in its practical form it was born of the Great War with the purpose to abolish war. It came into being in 1919, when the political, financial, and economic crises, whose settlement was urgent, while they may have revealed to the observant the gigantic tasks that would lie before the new institution, deflected from it public attention. The statesmen of the world were absorbed in dealing with these crises, whose effects fastened the thoughts of each nation on its own affairs. Thus the early proceedings of the League were little noticed and the excellent account, now given, of what has been done and why certain activities were undertaken, and how, in consequence, other activities followed, will have for many the force of novelty. Further, the tale of performance must convince all who read it carefully that the League is a necessity—that it is an organisation which has already achieved great things, and one which must be in the future of incalculable benefit to the world.

It is a commonplace that in medicine we have a department of knowledge which is truly international; the practice of medicine itself forms an international league as different nations enter into scientific relations with each other. In the efforts made to settle frontiers, to codify international law, to bring about coöperation along financial and economic lines, to organise disarmament, and to settle disputes by arbitration, there must always be room for qualifying discussions; but there can be no two opinions as to the benefit to the world of international schemes for the promotion of health. A nation must consider itself outraged if an historic province be taken from it to be added to the possessions of a neighbour, but no nation will have any objection to being robbed of its burden of sickness; and while commercial tariffs cannot be altered for the benefit of one people or industry without the risk of inflicting corresponding damage elsewhere, the improvement of health in any place on the globe tends to improve the health of the world at large. This was recognised by the delegates composing the earliest assembly of the League, and in the second meeting of the Council, held in February, 1920, only a few weeks after the settlement of the constitution, it was decided to summon an international meeting of health experts to draw up a scheme of organisation. And none too soon. For in April of that year epidemics of typhus, relapsing fever, and cholera, spreading from Russia towards the west, called for urgent measures, and the first duty of the international conference was the erection of a temporary Epidemics Commission. The strenuous work of this Commission was chronicled from time to time in our columns, and there is no doubt that, by the strength and authority which it gave to Poland and other countries in the institution of a sanitary cordon on the frontiers of Russia, it saved mid-Europe from devastating disease. While the Epidemics Commission was thus employed, a provisional health committee, which had been set up at Geneva, worked out the scheme for the Health Organisation of the League, which was adopted in September, 1923, when the relations of the League with the previously existing international official health authority, the Office International d'Hygiène Publique, were settled. The settlement was effected partly on the basis of official liaison, partly by the delimitation of function under which the older body has since continued and developed as its own the task of preparing and supervising formal agreements between Governments, on quarantine, and other medical administrative subjects. The proceedings at this Assembly of the League, as far as they related to medicine, were of extreme interest, and indeed made it quite evident that the League did not require to establish any monopoly in order to break the new and fruitful ground which was ready. The basis of permanent organisation, the international differences in mortality from diseases like cancer and the comparative figures in other diseases, the incidence of malaria and sleeping sickness, and the international standardisation of serums were among the subjects discussed, and the verbal views were immediately reflected in practical work which is now proceeding; this those specially interested have been able to appreciate in official publications, many of which have been noticed in THE LANCET.

Among the earliest activities of the Health Organisation was the collection and distribution of medical news. An epidemiological intelligence service was set up at Geneva and a bureau of information upon tropical maladies was instituted at Singapore. A dissemination of morbidity and mortality statistics followed, utilising and popularising that provided by the international agreements. This has been especially valuable in epidemiology, since here, before useful work can be done, the relative importance of the diseases must be ascertained. The first practical workers for the League knew this from experience, for the efficacy of the prophylactic measures taken along the Russo-Polish borders depended upon the interchange of

[1] League of Nations: Ten Years of World Coöperation. Foreword by Sir Eric Drummond, Secretary-General of the League. London: George Allen and Unwin, Ltd. 1930. Pp. 467. 10s.

prompt and full information across the frontier. All these matters are clearly set out in the new publication of the League Secretariat, which gives a clear story of the development of the League, and of international medicine under its auspices. It is a comprehensive and authoritative statement of the facts, and there is a happy omen in testifying to the value of the League of Nations within a few hours of Armistice Day.

CARBUNCLES AND X RAYS.

THE indications for radiotherapy in the treatment of skin diseases are in many ways indefinite, but increasing experience shows that in this branch of treatment X rays are the most useful single remedy we possess. From this point of view the various dermatoses fall into three groups. The first comprises those in which radiotherapy is the only means of affording cure or relief, and includes mycosis fungoides, inoperable tumours, regional hyperidrosis, and certain types of localised pruritus. The second group, by far the largest, is made up of conditions which respond best and most conveniently to the action of the rays, and includes acne, certain types of eczema, keloids, trichophytosis, and ringworm of the scalp. In the third group we may put lesions which respond only in selected cases and in which the remedy should be applied only after the failure of the other methods; examples of these being rosacea, lichen planus, leucoplakia, warts and condylomata, chilblains, and certain stages of lupus. Possibly a fourth group might be added in which, although results may be expected, the required dosage is too high for safety. A notorious example of this is hypertrichosis.

On theoretical grounds the treatment of septic conditions by X rays has always been regarded as hazardous, and yet if we consider the case of acne, which can hardly be described as amicrobic, we are faced with an exception which furnishes the X ray clinic with a notable percentage of its skin patients. This disease, which in its pustular stage is the result of staphylococcal invasion, is always benefited by a few carefully chosen and spaced doses of X rays, which suggests that other staphylococcal infections may be equally amenable, and such considerations may have led to a trial of radiotherapy in carbuncle lately described by LIGHT and SOSMAN.[1] In their report these workers analyse the results in 50 cases, and frankly confess that "radiation is not consistently followed by improvement"—an admission which argues unusual scientific detachment. LIGHT and SOSMAN believe that any benefit observed was due to acceleration of the necrotic process in the carbuncle, "a softening in the indurated stage," with consequent prevention of extension, "in a few instances." The treatment was occasionally given with success after surgical measures had failed to check the infective process; on the other hand, there was one case in which both methods failed and the patient died. Pain was relieved in a few cases, especially those in which the carbuncle appeared on the lip or cheek. Of the 50 cases cited, 34 appeared to benefit, and 16 did not appear to respond at all. Eight out of the nine carbuncles on the face "responded excellently," and (which may be significant) the larger the lesion the less was it influenced favourably. On the information given, and with no simultaneous controls treated by other methods, it is obviously difficult from this paper to assess the value of X rays in the treatment of carbuncle. It would be interesting to observe the effect in a case with two carbuncles, or, since these are very rare, in multiple furuncular lesions, one or more of which might be treated by X rays for comparative purposes.

The dermatological attitude to X rays is nowadays undoubtedly less stringent than it used to be. It is well known that furunculosis of the neck in its most chronic and obstinate form (dermatitis papillaris capillitii of Hebra) is amenable to X rays, and that if boils continue to appear in one area only, the use of X rays is justifiable. In two conditions, however, the application of this remedy is by general agreement disallowed—namely, psoriasis, because the disease tends to recur whatever treatment is given and the repetition of X rays indefinitely is highly dangerous, and hypertrichosis, because it is technically impossible to destroy the hair follicle without damaging the blood-vessels and elastic tissue in the area irradiated. The doses advised by LIGHT and SOSMAN for the treatment of carbuncle are well outside the zone of danger, being only 30 to 50 per cent. of the erythema dose, both with and without filtration; and in the latest American text-book[2] it is asserted that for the deep type of carbuncle "radiation therapy is invariably of some benefit, preference being given to filtered X rays." We have as yet no truly specific treatment for this condition, and until one is provided there seems to be a relatively good case for trying X rays before resorting either to surgery or the diathermy current.

THE TREATMENT OF FRACTURES.

THE main principles guiding the treatment of fractures are now well established. For closed fractures the requirements may briefly be stated as immediate restoration of the alignment of the fragments, their maintenance in position until firm union has taken place, and early attention to the circulation and general function of the limb. For open fractures we must add thorough cleansing of the wound by excision in the first instance, and a minimum of interference afterwards. These requirements, which are interdependent, must be the basis of any treatment of injuries to bone. ARBUTHNOT LANE, with a clear conception of the essentials, introduced open reduction of fractures and fixation of the fragments by metal plates. His teaching focused attention on the then inadequate methods of treatment and brought about a demand for its improvement, coinciding with a

[1] Light, R. U., and Sosman, M. C.: New Eng. Jour. Med., Sept. 18th, 1930, p. 549.

[2] Andrews, G. C.: Diseases of the Skin, Philadelphia, 1930, p. 522.

more general use of X rays for diagnosis. But progress was somewhat prejudiced by a sharp division of opinion into two schools, the non-operative and the operative, since it was not realised then—and perhaps is not fully now—that the two apparently opposite methods are really part of the same treatment, inasmuch as failure of non-operative measures in any particular case leads to a demand for open reduction. Nevertheless, surgeons were stimulated to aim at perfection of alignment even when they preferred not to undertake an open operation which, except in the hands of the few, had its obvious dangers; the vast amount of material available during and since the late war has made it possible to do much work on the subject. Hence, many methods have been advocated, with a widely varying technique, and by their very number these have led to a certain amount of confusion, so that a feeling of uncertainty has been created among practitioners, away from the large centres, who are called on to deal with severe injuries in increasing numbers. An urgent demand has, therefore, arisen for means of treatment which are not too complicated and ensure a good prospect of success, and for this reason the procedure employed by LORENZ BÖHLER, of Vienna, will probably find an increasing number of followers. BÖHLER has demonstrated a technique by which the essentials of treatment can be carried out without undue difficulty, mainly by an extensive use of transfixion pins through which traction is exerted and maintained by embedding the pins in plaster-of-Paris casts.

Whatever may be said about methods of treatment, the desire to treat fractures is probably individual. Those interested in the subject usually evolve a technique of their own and get good results with it, but to impart their knowledge to others working under different and less favourable conditions is peculiarly difficult. Moreover, many practitioners suffer a considerable handicap through feeling that they have neither the equipment nor the time for the close personal attention necessary to success, and accordingly look on severe fractures with a feeling of apprehension. These various factors account for the frequent statement that fracture treatment has lagged behind the other achievements of surgery during the past 25 years. This statement is not wholly true; the advance has been real, and there are few fractures which still defy reduction by one means or another, while the period of incapacity has been definitely reduced by early physiotherapy. Nor does it seem likely, for the time being, that there will be any radical alteration in the accepted methods of treatment—though details of technique may improve—and further advance must therefore be looked for in the better organisation of cases in general, and easier access to the best treatment available, which does not necessarily depend on outstanding individual skill so much as on sufficient equipment and general capacity. In Vienna, mainly at the instigation of Prof. BÖHLER, the insurance companies have become interested in the organisation of fracture work; in the United States the whole problem is under consideration by a committee of the American College of Surgeons; and we hope that before long it may receive attention from the proper authority in this country too. The solution is probably not easy but it seems that there should be a fracture clinic in every large centre, which should be able to exert a measure of control over its district. Such centres should be in close association with the smaller and cottage hospitals, and it ought not to be impossible to organise a service which could send a trained team with full equipment to any point in its area. Some such scheme would not only lighten individual responsibility but would give a greater sense of security to all concerned, while incidentally it would afford a means of spreading instruction in treatment.

Finally, education of the public is called for. It is natural to feel irritation at any accident, especially if it may mean loss of work or prolonged incapacity without compensation, but too often this irritation leads to resentment at any loss of function and perhaps a claim for damages against those who happen to have been called in professionally. The fracture has been too long regarded as a "simple" affair in which perfect "setting" can be performed without difficulty under any circumstances. A better knowledge of the facts might finally induce greater coöperation in any scheme for improvement.

PUBLIC HEALTH CONGRESS AND EXHIBITION.

AN official programme has been issued of the congress to be held at the Royal Agricultural Hall, London, from Nov. 17th–22nd, under the auspices of the various municipal associations interested in public health administration. On Monday the congress will be opened by Mr. Arthur Greenwood, Minister of Health, and in the afternoon will be addressed by Sir Arthur Newsholme on Medicine and the State. On Tuesday morning Dr. W. M. Ash will introduce the School Medical Service, Dr. J. R. Kaye presiding; the subject on that afternoon is Physical Education in the new Senior Schools. On Wednesday morning Mr. I. G. Gibbon, of the Ministry of Health, will speak on the Place of the Open Space in Modern Social Economy; in the afternoon Prof. E. Mellanby will consider Maternal Mortality. Thursday will be given up to problems of mental health; Dr. T. Beaton will deal with Some Practical Aspects of the Problem and Dr. E. S. Litteljohn with the Social Problem of Mental Deficiency. On Friday morning the Sterilisation of the Unfit will be discussed from various sides by Dr. C. P. Blacker, Dr. W. F. Menzies, Dr. A. F. Tredgold, and others; in the afternoon Prof. C. S. Myers will give an address on Industrial Psychology in relation to Public Health. The various associations will hold their own meetings during the week. We call special attention to a discussion on Hospital Libraries initiated by the Joint Red Cross, on Nov. 21st, at 3 P.M., when Sir Arthur Stanley will preside, and among others Mr. L. G. Brock, Sir Alfred Davies, Dr. H. L. Eason, Dr. Doris Odlum, and Miss M. E. Sparshott will speak. An exhibition of machinery and materials used in the various public health services will be open every day from 10.30 A.M. to 9 P.M. Sir Frederick Willis is chairman of the organising council, the hon. secretary of which may be addressed at 13, Victoria-street, London, S.W. 1.

ANNOTATIONS

VIEWS ON FIRST CAUSES.

A LITTLE obscured by the title of A Medical Service for the Nation, a discussion has been going on in our correspondence columns as to the proportion of the nation which is economically worthy of individual medical attention. On one side Dr. Bodman has contended that the factors of heredity must influence very largely the potentialities for disease, irrespective of environment, and he has no doubt that a relative increase of ethically and men tally inferior people is taking place. On the other hand, Mr. Layton does not believe in this increase, and challenges the data from which it has been deduced. He can see no sign of deterioration, and maintains that every Englishman comes from equally good stock and stands the same chance of having had a good ancestry whatever the financial position or social status of his immediate forebears may have been. In his Lloyd Roberts lecture, delivered in the medical school of Manchester University on Friday, Nov. 7th, the Bishop of Birmingham (Rt. Rev. W. Barnes) closely examined these rival views. He dealt specially with the inheritance of feeble-mindedness, which he described as the most socially dangerous type of mutation which has arisen in humanity. Why, he asked, is the gene, or group of genes, producing feeble-mindedness now so widespread in the population? And his confident answer was that our human instincts have caused us to modify the harsh social conditions under which many of the mentally defective would have been eliminated as soon as a new mental-defect mutation appeared. In nature deleterious mutations are constantly arising, and as constantly being suppressed by a hostile environment. Dr. Barnes has been able to discover no evidence that mutations dominate the trend of evolution. They merely appear; the power of the environment does the rest. As he sees the matter, good and evil arise with equal frequency in the variations associated with heredity, but the creative process of which we are products is active through the environment. He felt surprise at his inability to discover in the genetic mutations which are the raw material of evolution any moral quality; but perhaps, he added, the conclusion ought not to surprise us, for whenever we think to discover God at work further knowledge reveals a mechanism behind which He remains hidden. He concluded his lecture, however, by ranging himself with the thinkers who cannot fit righteousness and truth into a mechanical universe. It is significant that almost at the same time as Dr. Barnes was surrendering evidence of design in the gene's mechanism, the Rede lecturer was finding it in the universe outside. In his lecture delivered at Cambridge on Nov. 4th, Sir James Jeans pictured the birth of the solar system and found it incredible that the universe can have been designed primarily to produce life like our own. Had it been so, he said, surely we might have expected to find a better proportion between the magnitude of the mechanism and the amount of the product. He went on to describe the outstanding achievement of twentieth-century physics as a recognition that we are not yet in contact with ultimate reality. In terms of Plato's simile, imprisoned in our cave we can only watch the shadows on the wall. We have no extraneous standards against which to compare them. The real essence of substance, in Locke's phrase, is for ever unknowable, but yet by a very different route modern science has been leading the Rede lecturer to a philosophy summed up by an earlier bishop in the words, "All the choir of heaven and furniture of earth . . . have not any substance without the mind." The river of knowledge, said Sir James, has made a sharp bend in the last few years. Mind no longer appears as an accidental intruder into the realm of matter. We are beginning to hail it as the creator and governor of the realm of matter. Not, he added, our individual minds, but the mind in which the atoms, out of which our individual minds have grown, exist as thoughts; the universe shows evidence of a designing or controlling power that has something in common with our own individual minds.

SECRETION OF MUCUS BY THE COLON.

THE lining membrane of the colon is particularly rich in mucin-secreting or "goblet" cells, which are placed thickly on the inner layers close to the lumen of the bowel. While mucus is not obviously present in normal stools, small amounts are usually found coating scybala and inspissated masses of fæces in constipation. Large quantities of mucus may be passed in the condition known as mucous or muco-membranous colitis, and at times strings or casts are expelled with or independently of a motion. Following Nothnagel, this syndrome is generally attributed to hypersecretion on a nervous basis—a secretion neurosis. The casts consist of pure mucus with little cellular content; if leucocytes or many epithelial cells are present the condition is regarded as inflammatory or true colitis.

Certain of the glands in the upper alimentary tract, the salivary glands, for instance, and the glands of the bronchial mucous membrane, are known to be under the influence of the nervous system; secretion of mucus can be obtained by stimulation of the appropriate nerves or by administration of pilocarpine, while drying up of secretion is brought about by atropine—these drugs acting through the nervous system. H. Florey[1] now brings forward evidence that the secretion of mucus in the colon is a result of direct mechanical or thermal stimulation of the goblet cells, obtained without the intervention of the nervous system. It has been impossible by histological methods, he points out, to demonstrate nerves running to the epithelial cells of the colon. Portions of the colon, isolated by surgical means, and observed through fistulæ, secrete mucus in small amounts only, but much secretion of mucus is obtained when the mucosa is stimulated mechanically by rubbing or even by exposure to air, and chemically by such substances as mustard oil. This secretion is limited to the area which has been stimulated, and other parts of the colon are not affected, as they would be if nervous reflexes were involved. Indeed, a profuse secretion of mucus is seen in response to rubbing or mustard oil in a portion of colon grafted into the abdominal wall and isolated from its intrinsic blood-vessels and nerves by section of these. Florey obtained no evidence that stimulation of either the nervi erigentes or the sympathetic nerves to the colon is capable of stimulating the goblet cells to produce mucus. Large doses of pilocarpine injected intravenously and acting over prolonged periods are

[1] Brit. Jour. Exper. Path., 1930, xi., 348.

required to evoke secretion of mucus in the colon; and in such cases the goblet cells may be stimulated mechanically as a result of the violent bowel movements produced. On the other hand, secretion of mucus is readily obtained by mechanical or chemical stimuli applied locally to the colonic mucosa. Accompanying this secretion there is a local vascular dilatation, and it is of interest to study these phenomena in a little more detail in order to see if they may be brought into line with the results obtained by Sir Thos. Lewis in local reactions of the skin in the early stages of inflammation. Lewis has shown that in the skin the vascular and other phenomena of inflammation are brought about through the medium of a histamine body produced as a result of protein breakdown by the noxious stimulus. Florey's observations have led him to conclude that the secretion of mucus and the vascular dilatation are independent phenomena. He found that the injection or local application of histamine acetylcholine, adenosine, and peptone solutions failed to stimulate mucus-production from goblet cells. It appears, then, that the goblet cells directly react to the insult of the noxious agent, in contradistinction to the accompanying vascular reaction which, judging from the results on skin, is due to the liberation of some histamine-like body.

Florey's paper is full of interest and his thesis is well argued. But clinicians, while agreeing that the goblet cells of the colon pour out their secretion in response to local stimulation, will perhaps hesitate to subscribe to his contention that the secretion of mucus in mucous colitis is independent of the nervous system. The ætiological factors in mucous colitis are obscure enough, no doubt. It is hardly a clinical entity, but rather a collection of symptoms in which the underlying factor is an instability of the reactions of vasomotor, cutaneous, and sexual systems as well as the alimentary. That the nervous system takes no part in this symptom-complex is a view that cannot lightly be accepted on the results of some negative laboratory experiments.

VICARY'S PREDECESSORS.

Thomas Vicary was Serjeant Surgeon to King Henry VIII. and Master of the Barber-Surgeons Company, whose modern counterpart endows a lectureship in anatomy or surgery to commemorate his name. The lecture this year was delivered on Nov. 6th, in the theatre of the Royal College of Surgeons of England, by Prof. G. E. Gask, who took as the title of his lecture "Vicary's Predecessors," his object being to rescue from oblivion the names of those men, famous in their day, who had served the sovereigns of this country before Thomas Vicary. The earliest appointment given was that of Baldwin, Abbot of Bury St. Edmunds, who was the medical attendant of Edward the Confessor and described as a man "gretly expert in the craft of medycyn." At first the royal attendants were described as *medici regis*, surgery not having then been divorced from medicine, but in the reign of Henry III. the appointment bore the title *chirurgicus regis*. "Master William the King's Surgeon," was then presented to "the Church of Houkerinton, in the same diocese (Lincoln) in the King's gift by reason of the land of Thomas, son of Walter being in his hands." This Master William may be regarded as the first of Vicary's predecessors, and from this time on there is a continuous record of regal surgeons. Of some little is known but the name and the salary, ranging from £10 to £40 a year, to which were often added gifts of livings and lands as a reward of faithful service. Thomas de Weseham, surgeon to Henry III., was remarkable among other things for being granted a die for minting silver pennies, some of which are in the possession of Mr. L. A. Lawrence, F.R.C.S., and were shown by the lecturer. Expeditions of war during the reigns of Edward I., Edward III., and Henry V. gave the King's surgeons functions which foreshadowed the beginnings of an Army medical service; the senior of the King's surgeons, the Serjeant Surgeon, was made responsible for supplying a surgical staff and for collecting medical supplies. Prof. Gask illustrated his lecture with lantern slides of drawings from old manuscripts, an interesting exhibit being a surgical instrument case of fine craftmanship, lent by Mr. A. E. Williams, bearing the Royal Tudor Arms and the arms of the Barber-Surgeons Company. This case, it was suggested, may have been presented to Vicary by Henry VIII.

PROPHYLAXIS OF SYMPATHETIC OPHTHALMIA.

Dr. Albert Holdener, assistant in the Bürgerspital at Zug, gives an account[1] of five cases treated in the eye clinic at Zürich, in which sympathetic ophthalmia of the sound eye occurred after early enucleation of an injured eye. In the first case the wounded eye was enucleated 14 days after the injury when the sound eye was completely normal, both to external and to slit-lamp examination. Twenty-two days after the enucleation signs of slight irido-cyclitis supervened, confirmed by the slit lamp, but under energetic treatment with atropine, mercury, and salvarsan it ran a mild course without ever materially affecting the vision, and in ten weeks it was practically well. The second case was that of a man of 22 whose left eye had been blinded by an arrow wound at the age of 10. This eye became irritable and when the patient was admitted to hospital it was in a condition of secondary glaucoma. A trephining was performed and following this an extraction of the lens, but the eye got worse and then at last the patient gave his consent to having it enucleated. After three weeks in hospital the patient was discharged, but 12 days later two punctate spots appeared on Descemet's membrane of the remaining eye. In another fortnight, the signs of sympathetic infection being unmistakable, he was readmitted and intensively treated as in the previous case with such success that he was discharged in a month apparently cured and with normal vision. The third case was that of a man of 28 whose right eye was wounded by the horn of a cow. After three weeks' treatment, including removal of a prolapse of the iris and suturing of a scleral wound, the eye was removed on account of sympathetic danger, which pathological examination proved to be present. At this time there were no abnormal signs in the left eye, but a fortnight after the enucleation, spots on Descemet's membrane were detected which later on increased along with other signs of sympathetic infection. After six weeks' energetic treatment, however, the eye was cured and the patient was discharged with an eye possessing normal vision. These cases enforce the lesson that when an eye receives a wound involving the ciliary body, and more especially when the wound is so serious as to involve total loss of sight in the affected eye, it is dangerous to postpone enucleation even though there may be no sign, detectable by the slit lamp, of commencing infection in the second eye.

[1] Schweiz. med. Woch., Sept. 20th, p. 896.

Further, that when an eye is retained after being blinded by a wound, it is never certain, even many years after the original injury, that sympathetic trouble may not supervene as the result of a slight exciting cause. They also illustrate the encouraging fact that when a timely enucleation of an injured eye has been performed—i.e., before there is any sign even with the slit lamp of the infection having spread to the second eye, even if that eye does later show definite signs of sympathetic cyclitis—the prognosis is far more favourable than when enucleation has been deferred until actual detection of signs of infection in the second eye.

THE BARBITURATES IN LABOUR CASES.

AMYTAL (iso-amylethyl barbiturate) and sodium amytal have, so far as we know, not yet been used as analgesics in confinements in Great Britain. A preliminary report[1] from the Mayo Clinic, therefore, although based on under 50 cases, is valuable. For the results seem to justify further trial and the hope that here is a drug which can be given orally and which, while it affords analgesia, not only does not delay but tends to facilitate the progress of labour. The drug is given in divided doses, grs. 9 being regarded as the maximum dose. Labour is shortened because of the relaxation produced in the soft parts. The drug is to be taken late in the first stage of labour, grs. 3 being given as the first dose. If, in the course of the next four hours, the tone of the muscles is found to be returning and the patient is worried by the uterine contractions, the dose is repeated. The baby appears to be always unaffected by amytal. J. S. Lundy states that after grs. 13 had been given for a Cæsarean section the infant cried on delivery from the uterus.

PARALYSIS OF THE LARYNX.

Sir Felix Semon published in 1881 certain "Clinical Remarks" on paralysis of the larynx; he stated that if there was interference with the recurrent laryngeal nerve, either peripherally or at the centre, the first result of injury was paralysis of the abductor fibres supplying the posterior crico-arytenoid muscles, which open or dilate the glottis; the adductor muscles, constituting the sphincteric group, which close the glottis, survive for a longer time. This observation, known as Semon's law, was the subject of the Semon lecture delivered in the University of London on Nov. 6th by Mr. V. E. Negus. The lecturer devoted his attention to the evidences of comparative anatomy and physiology, for only by examining the origin of lungs, he said, could the facts be approached without confusion. As is well known, some fish swallow air, while others use a specialised alimentary diverticulum for breathing. Lung-fish or dipnoi have lungs, by means of which they are enabled to carry on respiration out of water, and to store up a reserve for use below the surface. In order to protect the lungs a valve is present at the mouth of the air tract in the form of a larynx, and a band of sphincteric muscle is the important constituent of this valve, since it has the vital function of preventing entrance of food or water by virtue of automatic closure. Because of its early origin and vital importance, the function of this band of muscle survives when other functions of the larynx are lost. Semon's law is thus supported and the influence of early origin has its effect in man, even though his larynx has undergone extensive modifications. In amphibians, reptiles, and birds the larynx is provided with lateral cartilages, but the sphincteric muscle still has a vitally important function in closing the glottis, especially in aquatic species. Mammals with a simple type of larynx must close the glottis during deglutition, but herbivorous species and also cetaceans have a special mechanism by means of which liquid or semi-liquid food passes on either side of the spout-like larynx while respiration continues; in animals of this type the sphincteric muscle loses in importance. In man, however, the lateral food channel is inefficient and the larynx must be closed during swallowing. The sphincteric girdle is divided into two paired and one single muscle, but it still serves a protective function; its nerve-supply is resistant to injury because of its mode of origin. There are slight variations in nerve-supply, which do not affect the truth of Semon's law.

To study the dilator muscles, continued Mr. Negus, a start is again made with animals with a simple type of larynx. In the Amazon mud-fish there are no muscles to open the glottis; in the African lung-fish circular fibres corresponding to the pharyngeal constrictors of man serve to open the glottis, while air is forced down the trachea by contraction of these muscle-fibres. Amphibians and reptiles have dilator muscles attached to the tips of the lateral or arytenoid cartilages, and arising from the cricoid ring; these muscles belong to the larynx and open the glottis in the form of a triangle, with the base directed forwards. In mammals and in man the larynx is tilted in order to straighten the air tract and the arytenoid cartilages are necessarily shorter than in lower species, this change leading to backward migration of the dilator fibres. The dilator muscles thereby work with added mechanical advantage; they open the glottis by rotating and pulling apart the arytenoid cartilages, the aperture assuming a triangular shape, with the base behind. Because of later inclusion in the larynx and because of unimportance in primitive types of larynx, the dilator fibres are more vulnerable than those supplying the sphincteric group.

Consideration of the primary functions described appears to explain the reasons underlying Semon's law, and from these Mr. Negus passed on to consider other and secondary functions of the two groups of muscles. A secondary function of the muscles closing the larynx is retention of air in the lungs, and to supplement the action of the sphincteric muscles some animals possess in the larynx valves of a mechanical nature. The dilator muscles also have an independent secondary function—namely, that of holding the glottis open during simultaneous respiration and deglutition, as is well illustrated in whales and dolphins. Neither of these two secondary functions is important in man. During phonation both groups of muscles are in action; the function is not a primary one and has no bearing on the truth of Semon's law, although Semon himself laid stress on it, to the confusion of the issue. Respiratory movements are carried out by mammals and by man, but this function again has no direct bearing on the question. Fixation of the thorax is assisted in arboreal species and in man by closure of the vocal cords. In conclusion, said Mr. Negus, the primary functions of the two groups of muscles must thus be separated from the secondary. They are found to consist of automatic protective closure of vital importance, carried out by the sphincteric group, and automatic opening for respiration, attained by contraction of the abductor or dilator muscles—the latter function being of little

[1] Proc. Staff Meetings, Mayo Clinic, Vol. v., No. 39 p 279.

importance in lower species, but of great importance in man, because of the valvular nature of the glottis and the dangers which result from sucking together of the vocal cords during inspiration. The fibres supplying the dilator or abductor muscles are more vulnerable than those supplying the sphincters, because of the later origin and originally inferior importance of the dilators.

CATHETER FEVER.

THE mechanism of catheter fever has always been something of a mystery. It is liable to occur after the urethra has been injured in persons whose urine is heavily infected with bacteria, but the precise relation of the bacteria to the fever has never been clearly made out. A contribution to the last number of the *Journal of Pathology and Bacteriology* (vol. xxxiii., p. 871), by Mr. F. J. F. Barrington and Dr. H. D. Wright, is an admirable example of collaboration between surgeon and bacteriologist which throws new light on the subject. Briefly, their results show that the blood stream is often invaded by bacteria immediately after the passage of bougies and again immediately after infected urine is passed over the injured surface. This bacteræmia is of very short duration and at the time when the patient feels ill or has an actual rigor the blood is again sterile. Thus, in one case, dilatation after an external urethrotomy was done at 10.40 A.M.; at 10.45 A.M. a blood culture was positive (*B. coli*): urine was first passed at 4.10 P.M. and at 4.20 P.M. the blood again gave *B. coli*. At 5.25 P.M. the patient had a mild rigor, and at 5.30 P.M. the blood was found sterile. In several instances blood cultures were made immediately before operation with negative results, while positive cultures were obtained within five minutes of dilatation. The effects of this bacteræmia do not appear for some time; the rigors are, no doubt, due to the products of destruction either of tissues or of the bacteria themselves, either of which takes time to happen, and when the rigor is going on the blood will probably be found to be sterile. There is therefore no reason to doubt that catheter fever is bacterial in origin and that one may expect to diminish its incidence by reducing to a minimum the injured absorbing surface in the urethra (which is practicable) and controlling the infection of the urine (which is not).

THE DOCTOR'S WIFE.

"DOCTORS have considerable difficulty in getting married," says Joyce Dennys; and we fear this difficulty may be even greater when everyone has read her poignant book on "Mrs. Dose, the Doctor's Wife."[1] Her seven heroines range from Lady Tonsil, who made her husband's reputation, to Emily Bragge, who let the brass plate get dirty. This, the author points out, is "one of the most terrible things a Doctor's Wife can do. I have known Doctor's Wives, when they and their whole households have been laid up with influenza, creep from their sick beds in the early morning and totter out to the gate with the Brasso, and you will often see a Doctor's little Bride, running out with a duster between showers." But most of the tales are about young women like poor little Mrs. Tibia, who do their utmost to please the senior partner's wife and vow that their husband's career shall never suffer by their unguarded behaviour.

> "The people gathered round her, and it was obvious to the meanest intelligence that medical attention must be obtained without delay. 'Where is your Husband?' they said, pressing round her and keeping out the fresh air. 'Tell us, where is your Husband?' As a matter of fact, Doctor Tibia was playing golf, but she had learnt her lesson. 'I am not . . . at Liberty . . . to Say,' whispered little Mrs. Tibia, and died."

A similar fate nearly overtook Mrs. Septum, whose husband disliked illness in the home; and no surgeon should neglect the account of her sufferings at the hands of Sir Cadogan Colon, who was always frightfully busy. Even more heartrending, perhaps, were the troubles of Mrs. Base and Mrs. Digit, two school friends whose husbands practised in a small country town and had a very serious quarrel. "The Quarrel was all about a Patient, and one Doctor thought the other Doctor had stolen the Patient away from him. Afterwards the Quarrel became more complicated, but that is how it began." The description of this and other situations shows a sharp insight into medical domestic affairs, and the book is illustrated by the author as amusingly as it is written. The profession will long be grateful for this charming satire, and the wives of practitioners may come to regard it as an "Uncle Tom's Cabin" which draws long-delayed attention to their bondage.

FOG AND ITS MEASUREMENT.

THE fifteenth report[1] of the Atmospheric Pollution Research Committee contains a welcome indication of increasing interest in the purity of the air we breathe. Six new observation stations were set up during the year, making a total of 81 now in operation. The report contains the data for deposit from the air at all these stations, and the results of some special investigations. To take an example, the relation of domestic to industrial smoke, which had been previously examined in London and found to be about 2·5 domestic to 1 industrial, was examined for Glasgow on the same basis, when the ratio for weekdays (excluding Saturdays) was found to be 3·6 domestic to 1 industrial. Of the other special subjects under investigation the measurement of water in fog is perhaps the most interesting. This was commenced some years ago (see the ninth report), when the effect of London fog in obstructing light was being examined. It was realised then that, while the number of solid particles suspended in the air during a fog could be estimated with some degree of accuracy, there was no means available for measuring the amount of suspended water particles. The obstruction of light being due to the effect of both solid and water particles, it became necessary to try to find a method of estimating the latter. A method was devised by Dr. J. S. Owens, based upon the increase of pressure caused by vaporising the suspended water particles.

> The measuring instrument consists of two exactly similar vessels side by side and connected only by a U-tube containing liquid paraffin, to act as a pressure gauge. One of these vessels has an attachment at the top to admit air through a calcium chloride drying tube; the other vessel, which has a wide neck, closed by a plug, is filled with the fog-laden air after the instrument has attained the surrounding temperature. Both vessels are at this stage open to the air, the pressure in both being the same. The entrance to each vessel is next closed. We have now in one vessel a sample of fog-laden air, in the other a similar sample of air containing

[1] Mrs. Dose, the Doctor's Wife. Written and illustrated by Joyce Dennys. London: John Lane the Bodley Head Ltd., 1930, pp. 140, 5*s*.

[1] Investigation of Atmospheric Pollution. Report on Observations in the year ended Mar. 31st, 1929. Department of Scientific and Industrial Research. H.M. Stationery Office. Pp. 64. 3*s*. 6*d*.

no liquid particles. The instrument is then placed in a hot water bath, the temperature of which is raised until the manometer shows no further change of pressure, when the difference in pressure between the two vessels gives a measure of the quantity of water drops vaporised, and thus of the quantity present in the fog. For example, if the pressure difference is equivalent to d mm. of mercury, the weight of water drops present in grammes per cubic metre is $289\frac{d}{T}$, T being the absolute temperature of the water bath in degrees Celsius.

Many difficulties were encountered in the operation of this instrument owing chiefly to the difficulty of preventing small leakages. It was, however, tried out with reasonably satisfactory results, and is now under investigation at the National Physical Laboratory, where the results are being compared with those obtained by ordinary gravimetric methods and with those of another form of instrument devised by Kohler. In Kohler's method the fog-laden air is drawn continuously through a tube, where it is warmed until the suspended drops are all evaporated, and the total moisture content, after such evaporation, is measured by a wet and dry bulb hygrometer. A measurement of the humidity before evaporation compared with that after, gives the data for ascertaining the quantity added to the air by evaporation of the drops. Kohler's method obviously depends on the accuracy of the wet and dry bulb hygrometer as a means of estimating the water vapour present in the air.

There is a general impression that the old-time London fog is disappearing, and a comparison of the annual reports shows that there was a fairly steady reduction in the amount of impurity deposited in London from 1915 up to 1921–22, the quantity falling (in round figures) from 400 to 300 tons per square mile. No doubt this resulted in a reduction in the smoke fogs. Since 1921, however, the deposit has remained nearly constant, nor has the amount of suspended sooty matter in London air diminished much during the last ten years. The maximum weekday concentration at Westminster, which usually occurs in the forenoon, has during the whole of this period averaged 150–200 milligrammes per hundred cubic metres. It is not to be assumed, therefore, that the air of London is steadily improving, and that our efforts to purify it may safely be relaxed.

THE VALUE OF MERCUROCHROME.

THE value of mercurochrome as a therapeutic agent formed the subject of a discussion at a meeting of the Section of Therapeutics of the Royal Society of Medicine on Oct. 11th, under the presidency of Dr. Philip Hamill. Apparently one of the chief difficulties experienced by those who wish to estimate its effect lies in the difficulty of obtaining a commercial product of standard composition. Dr J. H. Burn, who has recently tested the toxicity of eight different samples of mercurochrome by injection into mice, was able to produce figures showing a wide range of variation from the theoretical product. At least five of these eight samples were prepared by different firms; analysis showed that while, theoretically, mercurochrome should contain 26·7 per cent. of mercury, 21·3 per cent. of bromine, and no acetate, one product out of the eight contained as much as 40·9 per cent. of mercury, only 11·4 per cent. of bromine, and 7·5 per cent. of acetate, and the remainder contained proportions of these substances which showed wide deviations from the theoretical values. By injecting different quantities of each sample into large numbers of mice he was able to estimate the average lethal dose of each product—that is to say, the number of milligrammes per kilogramme of body weight which would suffice to kill 50 per cent. of the mice injected. He found that the least toxic sample contained the amount of mercury which approximated most nearly to the theoretical value, but that the toxicity of any sample by no means ran parallel to the proportion of mercury. He pointed out that it was impossible to assess the value of mercurochrome until the medical profession had insisted on the production of a standardised preparation by the manufacturers. Sir William Willcox felt that this was an argument for relegating the use of mercurochrome to a time when there was no danger in its use, either to the healthy person or to the patient in dire extremity; but the majority of speakers, if not enthusiastic, were able to award it the tribute of the old Scottish woman to her doctor, and to say that at least it did no harm. Mr. K. Heritage, however, had found it to be of value given intravenously in cases of appendix abscess which ran a swinging temperature after operation. Usually the temperature settled after the first injection, and later rose again, but two or three doses sufficed to bring about complete lysis. It was also effective, if used to wash out the bladder, in cases of intractable chronic cystitis, especially in women, but as a wash for the renal pelvis in pyelitis it had given disappointing results. Some good effects had been observed by Mr. L. C. Rivett from the use of local applications of mercurochrome in chronic cervicitis, but as an intravenous injection for puerperal sepsis he had found it to be disappointing, especially where the infecting organism was a hæmolytic streptococcus; in the presence of a *B. coli* infection there was a greater chance of benefit to the patient from its use. No other outstanding examples of the value of mercurochrome were quoted, and apart from chronic cervicitis, appendicitis with abscess, and cystitis, the feeling of the meeting was apathetic rather than laudatory.

THE Council Dinner of the British Medical Association took place on Tuesday evening last at the Hall of the Association, when Dr. Brackenbury presided over a large company and many distinguished guests. A report of the function will appear next week.

EXHIBITION OF OXFORD BOOKS.—An exhibition of Oxford Books, in connexion with the centenary of the removal of the University Press at Oxford in 1830 from the Clarendon Building to its present site opposite to the Radcliffe Observatory in Walton-street, was opened on Nov. 6th at the Old Court House, Marylebone, W., the new premises of Messrs. John and Edward Bumpus, Ltd. The exhibition will remain open till the end of January, 1931, between the hours of 9 A.M. and 6.30 P.M. on weekdays, with the exception of Saturdays, when it will close at 1 P.M. It shows the developments in printing of the University for the past 100 years and the conditions which prevailed in the early days of Caxton.

CHELSEA CLINICAL SOCIETY.—The annual dinner of this society was held at the Rembrandt Rooms on Oct. 28th under the chairmanship of Mr. F. J. McCann. Ninety-six members and guests attended, the latter including Lord Riddell, Sir Thomas Horder, and the presidents of five kindred medical societies. Letters apologising for their absence were received from Lord Moynihan, Sir John Rose Bradford, Sir H. Curtis Bennett, and the Secretary for Education to the Government of India. The first dinner meeting of the session will be held at the same place on Tuesday, Nov. 18th, when Dr. Anthony Feiling will open a discussion on the Treatment of Headache. All inquiries should be addressed to Mr. Rugg-Gunn, 49, Harley-street, W. 1.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCXI.—NEONATAL ASPHYXIA.

PART II.

IN quite a different category from the cases of blue asphyxia discussed last week are those infants born in a state of

White Asphyxia.

Here the child is in a condition of shock. It is essential to realise this fact, and then the paramount need for warmth and quietness will be realised. No one would treat a case of post-operative shock with very poor respirations by smacking the patient, sprinkling him with cold water or waving his arms about in the movements of artificial respiration. Why, then, should the white baby, who is suffering from a comparable degree of shock, be subjected to such barbarous methods?

Warmth.—Instead, the infant should be separated from the mother by dividing the cord between two pairs of Spencer Wells forceps at fully six inches from the umbilicus. The child must then be warmed. For this purpose there is much to commend dry heat by warm blankets, but in practice it is more convenient to place the child in something which can immediately be prepared—viz., a bath at a temperature of 105° F. Whenever possible this temperature should be checked by a thermometer, for the rubber-gloved hands of the doctor and the skin of the midwife used to very hot water seem to be incapable of appreciating as uncomfortably hot anything less than, say, 110° F., which temperature would be a menace to the infant. If a thermometer is not available, the well-known trick of using the skin of the elbow to test the heat of the water is better than nothing, since any temperature dangerously hot for the infant will be appreciated as unpleasant by this means. Furthermore, the temperature of the water must be maintained at 100° F. to 105° F. This is well worth bearing in mind, since in the stress of other activities it is easily forgotten, and thus one may let the water become dangerously cold for the child.

Extraction of mucus.—The next essential is the thorough clearing of the air passages by a mucus extractor in the manner already specified, and at the risk of tiresome repetition it must be stressed that this step is absolutely necessary and must be performed with care, gentleness, and completeness. The infant's tongue is now held forward, and since it may have to be maintained in this position for some time, a suture passed through the tongue near the tip from side to side would seem to be the most suitable method of achieving this. It must be remembered that time is an important factor in the treatment of these cases, since prolonged apnœa increases the shock from which the infant is suffering. There is little time lost in passing a stitch and thus securing an efficient tractor, since suture materials—preferably fine silk-worm gut—and needles should always be ready to hand. Gentle rhythmic traction on this suture will now serve not only to open up a good airway but also, if performed at intervals of, say, ten seconds, to act as a stimulant to respiration without increasing shock.

Drugs.—It was stated above that the cord should be clamped and divided fully six inches from the umbilicus. This is desirable because it is found that alpha-lobeline injections are of great assistance in the treatment of white asphyxia. Alpha-lobeline can be obtained in solution in ampoules, and of this solution about six minims should be injected into the umbilical vein. A blue bulge is selected and the injection made into this. Then the drug is massaged into the fœtal circulation by compressing the cord from the clamp towards the umbilicus. Another stimulant which may be given instead is Coramine, of which 10 to 15 minims may be injected intramuscularly; in addition brandy may be wiped over the lips, gums, and cheeks in the usual manner.

STIMULATION OF CIRCULATION AND RESPIRATION.

It is found in practice that the result of such treatment as has been described is that the child sometimes begins to gasp and that these gasps recur at gradually lessening intervals. In other cases no improvement seems to take place. The needs of such an infant are obvious. First, there is adequate circulation of the blood; secondly, oxygen is required as a food for the respiratory centre; and thirdly, carbon dioxide is required to stimulate that centre. How can these needs be supplied? A very useful lesson can here be learnt from an experimental animal like the cat. If such a cat dies it may be stated, on the authority of Sir Leonard Hill,[1] that some degree of even peripheral circulation can be maintained by rhythmically compressing, first the abdomen, whereby some blood is squeezed into the right side of the heart, and then (laterally) the thorax. By this latter manœuvre not only is some blood pushed round the pulmonary circulation and thence into the systemic one, but also the recoil of the chest wall may inspire some air into the lungs.

It would seem advisable to attempt to treat the "white asphyxia" case in the same way—namely, by gentle rhythmic compression first of the abdomen and then of the thorax, and with very little force.

Any other manœuvre in the performance of artificial respiration in the accepted sense of the phrase is absolutely contra-indicated as harmful. The temptation to perform artificial respiration must be recognised; it is hard to refrain from other movements designed to draw air into the lungs of such an infant when it appears to be dying despite the treatment here detailed. But if the child is going to recover it will do so without the application of what can only be described as ill-judged violence. And it is certain that the extra shock induced by such violence has been the direct cause of death in many infants who otherwise would have survived.

While still considering the white baby's need for an improved circulation, it should be recorded that in cases where the defect is due to raised intracranial pressure, improvement is said to have been obtained by lumbar puncture. This has even been advised as a routine for all such cases, and in my very limited experience of this treatment it has seemed of value. But in general it is probable that the manipulations required would do harm more than enough to counterbalance the good that might be derived, except in carefully selected cases—and the selection is difficult to make.

The next two great needs of the type of baby under consideration are oxygen and carbon dioxide. The

[1] Personal communication to the Hon. Medical Staff of Queen Charlotte's Hospital.

supply of these gases in a suitable manner is a matter of considerable difficulty. With elaborate apparatus this can be overcome, but the practising obstetrician is up against a very difficult problem. In obstetric hospitals it is usual now to find cylinders containing a mixture of 6 (or better, 7) per cent. carbon dioxide in oxygen. A gentle stream of the mixed gases can be obtained from such a cylinder, and by fitting a rubber delivery tube continued by a soft rubber catheter this mixture of gases can be delivered to the child's nasopharynx by passing the catheter along the nostril. It would be a great convenience if there were an apparatus on the market, similar to the Fallopian tube insufflation apparatus, by which carbon dioxide and oxygen in the required proportions could be delivered from a "sparklet" cylinder through a reduction valve, and thus be available for transmission in a manner similar to that above described to the nasopharynx of the white baby. Even then one would be largely dependent on the active respiratory efforts of the child for the oxygenation of the blood circulating as the result either of the natural heart action or of the rhythmic pressure alternately on abdomen and chest as described above; but one would not be entirely dependent on respiration efforts, for the rhythmic pressure would cause at least some disturbance of the gases in the upper respiratory passages, and if a gentle stream of oxygen and carbon dioxide is passing into the nasopharynx a sufficiency of these gases would probably be diffused and absorbed and would be conveyed by the circulating blood, thus acting as a food and as a stimulant to the respiratory and other medullary centres.

In saying that these are the only satisfactory methods by which respiratory exchange can be established, intratracheal insufflation is not forgotten, but is dismissed as being impractical. And with regard to "mouth to mouth" respiration it is my belief that such a manipulation is not only rarely of use, in that it forces air into the child's stomach rather than into its lungs, but is also harmful in that it increases shock. Moreover, when air is thereby caused to enter the child's lungs, harm is sometimes done by rupturing the pulmonary alveoli.

CONCLUSION.

To sum up in the words of Appendix II. of the Medical Research Council's publication on Child Life Investigation,[2] the main points in the treatment of asphyxiated new-born infants are: (1) the avoidance of all violent attempts at resuscitation; (2) absolute rest, warmth, and quiet; (3) the immediate toilet of the air passages so as to remove mucus, meconium, and liquor amnii; (4) the supply of a mixture of oxygen and carbon dioxide; (5) reduction of intrathecal pressure by withdrawal of cerebro-spinal fluid in certain cases, particularly those with signs suggestive of intracranial bleeding.

LESLIE WILLIAMS, M.D., M.S. Lond., F.R.C.S. Eng.,
Surgeon to Out-patients, Queen Charlotte's Hospital.

[2] Special Report Series, No. 145, p. 79.

SPECIAL ARTICLES

THE POSITION OF NURSING: PAST AND PRESENT.

LAST week we announced THE LANCET Commission of Inquiry into conditions of service of the nursing profession, with special reference to the recruitment of suitable student nurses. The Commission is not yet quite complete, but the following have consented to serve:—

Prof. HENRY CLAY, M.A., D.Sc., late Professor of Social Economics in the University of Manchester.

Miss R. E. DARBYSHIRE, R.R.C., Matron, University College Hospital.

Miss L. CLARK, M.B.E., R.R.C., Matron, Whipps Cross Hospital.

Dr. ROBERT HUTCHISON, F.R.C.P., Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street.

Prof. F. R. FRASER, M.D., F.R.C.P., Professor of Medicine in the University of London, Physician to St. Bartholomew's Hospital.

Mr. A. LISTER HARRISON, J.P., Chairman, Committee of Management, Metropolitan Hospital.

Miss M. D. BROCK, D.Litt., Headmistress, the Mary Datchelor Girls' School.

Mrs. OLIVER STRACHEY, Chairman, Employments Committee, London Society for Women's Service.

Miss EDITH THOMPSON, C.B.E., Member of Council, Bedford College, University of London.

Sir SQUIRE SPRIGGE, M.D., F.R.C.P., the Editor of THE LANCET, with Dr. M. H. KETTLE, an assistant editor, as honorary secretary. The name of the chairman will be announced later. Any organisation or individual wishing to provide evidence for the Commission to consider, or to offer suggestions relating to the improvement of conditions of service of the nursing profession, is asked to communicate with the hon. secretary at THE LANCET offices.

1871.

The interest taken by this journal in the conditions of service of the nursing profession is of no recent date. In 1871 the conditions of night nursing in some London hospitals were investigated by a commissioner representing THE LANCET. The coöperation of several hospitals was enlisted, and visits were paid to the wards between 9 P.M. and 1 A.M. Of the conditions described, those of more permanent interest concern the numerical sufficiency of the staff in relation to the gravity of the cases and the structure of the wards, and the hours of duty. Other points which were important 60 years ago, such as the modes of obtaining additional aid in cases of emergency, or the regulation of the warming and ventilation of the wards at night, have now, with the ubiquity of electric bells, telephones, and central heating arrangements, become only of historic interest. Appended are a few notes on the conditions as then recorded in our columns.

At one hospital "with rather better than 100 beds, we found seven nurses on night duty, not one of whom had yet had a twelvemonth's experience of her work. They were all probationers, and most of them very young. There was not a single fully trained nurse on duty. . . . There is no regular system here for the night supervision of the nurses."

At another hospital the commissioner reports "a state of things which, to our mind, comes very near perfection. The staff consists of 43 nurses and 9 sisters. To every 35 patients (the number contained in a group of two wards) are allotted one sister, four nurses, and one probationer. The four nurses take it in turns to go on night duty—two

on and two off. . . . There is a regular night superintendent who comes on duty every evening at nine o'clock, and who is expected, under ordinary circumstances, to visit each ward in the hospital three times every night. . . . The sisters sleep in small rooms adjoining the wards, and, if an emergency arises, the nurse can call the sister, who takes charge of the case while she (the nurse) goes to fetch the medical officer."

At an infirmary "there were two nurses on night duty, each of whom, with no assistance of any kind, had charge of upwards of 200 patients!"

At another hospital "there are about 200 beds. The nursing staff consists of the matron, six sisters, and sixteen nurses. . . . There are seven night nurses, so that each nurse has the charge, on an average, of 33 patients, but for cases requiring extra attention special nurses are provided. The night nurses come on duty at 10 P.M. and remain on duty till 2 the next afternoon. . . . There is no superintendent of night nursing."

Elsewhere, "the hospital contains 150 beds, and the nursing staff consists of a sister superior, who has entire control, and is assisted by five sisters and 23 nurses and probationers. At the time of our visit there were 11 nurses on night duty. The nurses are by turns on day and night duty, taking a month at each. The night nurses are on duty from 9 P.M. to 9 A.M., and before going into their wards are regaled at 8 P.M. with a substantial meat supper, with tea or beer."

1890.

In 1890 THE LANCET Sanitary Commission made a report on the duties, pay, diet, and recreation of hospital nurses, as deduced from their own testimony. Of the information elicited, mostly from private inquiry, we select the following notes:—

"One of the commonest subjects of remark on the part of my correspondents is the food with which they are supplied. The cooking especially seems often to be faulty. Even when neither quantity nor quality is open to reproach, nurses complain of want of variety in food, and of the absence of fruit even in its season. One writes: 'At times the cooking has been very bad, quite spoiling and wasting good food.' Another says: 'A little more attention to the cooking and serving of food would render it much more appetising without additional expense. The monotony of the diet, and not the quality, is distasteful to a tired nurse' . . . This fault, though undoubtedly existing in some institutions, is as certainly avoided in others. Thus, from another hospital the testimony is: 'The food is good, abundant, and well cooked.'

"But what strikes me as being the most urgent demand is for a shortening of the hours of unrelieved work. . . . I will give the direct testimony of two of my correspondents on this point. The first writes: 'In my opinion the chief evil of the present system of nursing is the long hours the nurses are compelled to be on their feet, and there will be no remedy for that till the day is divided into three parts of eight hours, with three relays of nurses. The night nurses are especially hard worked, for they are on duty 12 hours, and in the medical wards often have not the chance of sitting down for even half an hour; then, after a hard night, have beds to make, washing of patients, dusting, and breakfast to prepare and to give each patient.' Another lady writes: '. . . I have now worked in a hospital for over a year, and my experience is that the whole cry of nurses off duty is "Oh! I am so tired." Should this be? Should a nurse off duty feel so worn out as she does? I quite think that the eight-hour system should be introduced in hospital. Why should not some little bit of the charity which is so freely given to the patients be extended to the nurses?' . . . One of my correspondents says, 'Recreation time is most often spent in resting. Very energetic nurses spend it in studying. I find nothing but the animal instincts for food and rest are left me in my recreation times. I am too tired for any mental exertion' . . . . By a comparison of the papers in my possession I gather that the one holiday of the nurse's long year averages two weeks for a probationer, three for a staff nurse, and four for a sister. A probationer in one hospital where the leave of absence is only ten days writes pathetically: 'The committee will not hear of our having a longer one. When one spends two days in the train, as some of us have to, it leaves us eight days, and to spend about £3 on it seems waste.'

"A rule obtains in some institutions of imposing household drudgery upon nurses. It surely is a very bad economy that employs a valuable expert as a mere housemaid. Why must these ladies be asked to expend their last bit of energy to 'sweep floors, scrub lockers and locker boards, clean brasses, and even keep lavatories in order, to clean lamp globes, and polish head boards?'"

1906–1910.

Early in this century allusions to the nursing profession in our columns are largely concerned with the development of district nursing and the conditions of nursing abroad. Two paragraphs from THE LANCET, 1906, ii., 175, and from 1910, ii., 1456, show that the diet offered and the hours of work exacted were causing public concern.

"*Feeding of Nurses.*—Under the auspices of the National Food Reform Association a conference of hospital matrons was held in Caxton Hall, London, on Nov. 5th to discuss the question of nurses' food in hospitals and similar institutions. . . . The general complaint, as expressed by many representatives, seemed to be the monotony of hospital fare, and many suggestions were made as to the practicability of altering this by adopting some of the French *réchauffé* dishes, and the German methods of cooking vegetables. The chief difficulties apparently lay in the extra thought in planning which would be thrown upon the caterer and upon the intelligence of the cook. But all were agreed that if the result is to be greater vigour in mind and body in the nurses, who are, after all, responsible for carrying out the medical treatment of the patients, then it is certainly worth while attempting to overcome these difficulties. One speaker said she thought the food was not of so much importance as the time taken for meals. In many institutions the nurses have only half an hour for dinner, out of which at least five minutes is taken up in going to and from the wards and dining-room.

"*Nurses and the Public View of their Work.*— . . . The infirmary committee, in the course of a report to the board, called attention to the fact that the infirmary was understaffed, pointing out that a probationer nurse was often in charge of more than one ward—that is, of more than 50 patients. A member of the committee, in moving the adoption of the report, pointed out the severe strain upon the night staff of the hospital and stated that the night nurses had to go without their meals owing to the pressure of their duties. It was proposed that six additional nurses should be appointed, so as to have one on night duty for each ward, which would appear to be a reasonable demand, indeed, the least compatible with safety. Eventually, after some discussion, it was decided to appoint three additional nurses instead of six."

1923.

In 1923 a book appeared[1] which, whether or not the conclusions reached therein find acceptance, sets out the problems requiring solution in clear detail. The book embodies a report of a committee appointed by the Rockefeller Foundation to study "general nursing education with a view to developing a programme for further study and for recommendation of future procedure." The following is an extract from our summary[2] of that section of the work which deals with American

HOSPITAL TRAINING SCHOOLS.

"The development of the hospital training school for nurses constitutes a unique chapter in the history of education. In almost all fields of professional life education has begun on a basis of apprentice training. The first law schools and the first medical schools were the outgrowth of the lawyer's and the physician's office. In nearly all other fields than that of nursing, education has outgrown the apprentice stage and leadership has passed into the hands of independent institutions, organised and endowed for a specifically educational purpose. The training of nurses, on the other hand, is still in the main directed by organisations created and maintained for the care of disease rather than for professional education. The progress which has been accomplished under such anomalous

[1] Nursing and Nursing Education in the United States (Report of the Committee for the Study of Nursing Education). New York: The Macmillan Company. 1923. 15s.

[2] THE LANCET, 1923, ii., 1204.

conditions is such as to reflect high credit upon both hospital administrators and the leaders of the nursing profession. Yet the conflict of interests between a policy of hospital administration, which properly aims to care for the sick at a minimum cost, and a policy of nursing education which with equal propriety aims to concentrate a maximum of effective training into a minimum time, is a real and vital one. The fact that the nursing profession fails to attract students in the number, and of the quality desired, strongly suggests that there is some shortcoming in the established avenues of approach thereto. The hospitals themselves, depending as they do so largely upon student nurses for their routine operation, have found themselves seriously handicapped by the small number of well-educated applicants. Inspection of 23 training schools representative of the best current practice in nursing education revealed some interesting points. For example, in some cases theoretic instruction was at fault; in others, ward duties appeared to be largely dictated by the need for hospital service rather than by the educational requirements of the students. This was evidenced by the astonishing irregularity of the time spent on different services by individual students and by the marked deviation between the duties actually performed and those scheduled in the official programme of the course.

The supervision of work in the wards was in certain instances notably inadequate. In only a few brilliantly exceptional cases was the ward work purposefully correlated with theoretical instruction. The lack of an intelligently planned progressive training was obvious in a large number of the hospitals studied, first year students often being found in positions of responsibility for which they were wholly unprepared, while seniors in another ward were repeating an educationally idle and profitless routine. Most striking of all was the factor of time wasted in procedures essential to the conduct of the hospital but of no educational value to the student concerned. Hours and days spent in performing the work of a ward maid, in putting away linen, in sterilising apparatus, in mending rubber gloves, in running errands, long after any important technique involved had become second nature, accounted in one typical hospital operating under the eight-hour system, where this problem was specially studied, for a clear wastage of between one-fourth and one-fifth of the student's working day.

The total amount of time assigned to ward service under the conditions which obtain in many hospitals is, in itself, a fairly complete obstacle to educational achievement. The selected group of hospitals, in this respect above the general average, showed a median day of between 8 and 8·5 hours on ward duty alone, exclusive of all classroom instruction. Irregular, excessive, and unproductive night duty was the rule rather than the exception. Crowded and unattractive living conditions tend, in certain hospitals, to impair the morale of the student body, and an atmosphere of autocratic discipline frequently prevents the development of a psychological atmosphere favourable to effective coöperative effort. It is emphasised that such shortcomings as have been pointed out are not fairly chargeable to deliberate neglect on the hospital authorities or nursing superintendents. In so far as they exist, they are due to the inherent difficulty of adjusting the conflicting claims of hospital management and nursing education, under a system in which nursing education is provided with no independent financial endowments for its specific ends."

In the issue of THE LANCET which contained this summary appeared the following letter from "A Middle-class Patient," reflecting another side:—

"I have just recovered from a troublesome prolonged but not very dangerous illness in which I badly wanted someone to wash me, to bring me my food, to make my bed, and in fact to attend to my physical needs. My doctor wished me to engage a trained nurse, a demand with which I should have been only too happy to comply if it had been possible to provide the extra accommodation, household service, and the meals more elaborate than the usual family ones. I could not face the prospect of having a guest who was entitled to a higher standard of comfort than that of my very modest household. The situation is a familiar one for which I can see no solution. Maybe there is no solution."

1930.

The following are extracts from some of the anonymous letters we have received from nurses following the publication of Dr. E. Carling's letter on Oct. 11th:—

"Though there still exists a large body of good nurses doing magnificent work throughout the country, it would, however, be folly to close our eyes to the fact that our profession is faced with new and urgent problems which call for coöperative effort. We seem to be passing from an era of altruism to one of individualism, and if all the time devoted to condemning the times we live in was devoted to new methods of adapting old machinery to present conditions half our problems would have been solved. Few, except those who have tried it, can realise the sacrifice entailed in working in a small special hospital or sanatorium after the varied and active service experienced in a big training school. Provided one cares sufficiently for the sick, any form of nursing is entirely satisfying and compensates for the almost complete loss of the amenities of a normal social life which a nurse forfeits on entering the profession. But the altruists are passing away and the individualists ask more than nine or ten hours a day devoted to often monotonous service, a thousand restrictions of institutional life, and a salary of about £60 a year. I agree with your correspondent that nursing is a great work, and if that is true, it calls for the finest women, and we shall not get them until the value of their service is openly acknowledged by the medical profession and they are accorded the education, payment, and social status commensurate with the services that they are rendering. At present, I consider the public has a better nursing service than it deserves, but undoubtedly, the service would be improved if a minimum standard of education was demanded for all entrants to the profession and a larger number of fully qualified nurses employed for the actual nursing, instead of training as at present, a large body of probationers eminently unsuited for the great work of nursing. If they were justly remunerated and accorded the professional and social status rightly due to them the women for the vacancies in our hospitals would soon be found."

"The modern educated girl is going to be nobody's 'handmaiden,' and the medical profession having exploited the 'handmaiden' idea of the nursing profession the servile attitude of the nurse has resulted in a loss of social status, which the girl whose brothers are often doctors is not prepared to accept. Medical science would be practically wasted unless there was a profession such as ours prepared to assist in its application. What is that service worth to the medical profession and the community? It has never been properly acknowledged by the former or paid by the latter, and when it is the finest women in the country will fill its ranks. A conference representing the public, the medical profession, and the nursing profession might possibly result in a little more understanding of what we all expect of each other, provided we are all allowed and have the courage to say what we really do expect."

"If the big hospitals still find recruits, but the lesser ones advertise in vain, it seems that there is something wrong with the lesser ones. 'Training' should not be offered by institutions which are not equipped to bring trainees to the State examination standard. In recognised schools conditions of work, teaching, and living have much improved of recent years—the changes for good are being made gradually but continuously, and it seems safe to presume that this improvement will continue. Training schools and lesser hospitals, sanatoria, &c., must coöperate in making a nurse's life satisfying and interesting. Is

it fantastic to suppose that a system could be evolved whereby a large institution could undertake the nursing in small or special 'daughter' institutions? The matron, sisters, and junior grades would be recruited from the large institution (for varying but not too long periods of service in the daughter institution). This might be to everyone's benefit, and in a four years' training it should be possible to make satisfactory arrangements to ensure recognition by the General Nursing Council. In lesser or special Hospitals salaries of £60–70 p.a. (from which contributions to superannuation funds are often deducted) are frequently offered. (Compare the salaries of £40–50 offered in the same institutions to untrained or semi-trained workers.) The hospital or sanatorium may be miles in the country, when even the weekly day off may become an expensive or tedious necessity, whereas annual holidays may not exceed three weeks, but most of all the nurse may be regarded merely as a rather superior domestic servant, and not at all as an intelligent and trained woman able and willing to coöperate in the doctor's lines of treatment. Many hospitals which can offer no advantages of training should be able to attract and offer congenial work to older nurses, many of whom find it increasingly difficult to secure the nursing of acute cases."

The extracts given above, which range over a period of 60 years, indicate that the conditions of nursing service in hospitals have not changed as much or in the same directions as conditions of work in other communities.

To what extent this conservatism is a necessary corollary of lives spent in caring for the sick, and to what extent it is due to other causes, it will be the business of the Commission now appointed to investigate.

STUDIES ON THE ARNETH COUNT.

THE problem of the polymorph had exercised the minds of hæmatologists for many years before J. Arneth[1] in 1904 published his classification of this leucocyte and described its behaviour in infections. His clinical results have received ample confirmation, but no explanation of the marrow reaction nor of the many points in connexion with the nuclear changes in the neutrophil polymorph was attempted until Dr. Eric Ponder, now professor of physiology in New York University, initiated in Edinburgh a series of experimental studies on the Arneth count, which are published from time to time in the *Quarterly Journal of Experimental Physiology*. The early papers, of which the first appeared in 1926, dealt with the relations between phagocytosis and nuclear configuration, and between nuclear configuration and nuclear area, the steady state of the count, the effect of thyroidectomy and the effect of various drugs and extracts on the polynuclear count. Whilst working on the effects of thyroid extract in rabbits, Ponder elucidated the life-history of the polymorph in the blood stream. Other papers of the series by Ponder and his co-workers at the Edinburgh school of physiology included those on experimental tuberculosis in the rabbit, deflection of the count by X rays, the relation between diapedesis and nuclear configuration, the deflection of the count by ultra-violet rays, the relation of the Arneth count to the total polymorph count, and the deviation of the count by various autacoids and animal extracts.

The Count in Surgical Tuberculosis.

The June issue of the *Journal* contains a further series of papers, including one on the Arneth Count in Surgical Tuberculosis in the High Alps, by Walter P. Kennedy and K. Newstead Flint. The authors discuss the Arneth count in cases of joint and bone tuberculosis treated by natural heliotherapy at Leysin. In a previous paper Kennedy and Thompson have shown that ultra-violet rays stimulate the hæmopoietic tissues to pour young polymorphs into the blood stream. Five hundred cases of surgical tuberculosis were examined by one of the authors and a striking difference was observed in the appearance and demeanour of the patients as compared with similar cases treated in this country. The great majority were deeply bronze and, notwithstanding long periods of immobilisation, showed a general muscular development unusual even in healthy persons in Scotland. The end-results were as remarkable—repair of both structure and function being exceedingly good. Blood films were taken from 140 patients—every patient in certain wards—no attempt being made to select patients approaching a cure. Distribution curves of the weighted means of the polynuclear counts in normal persons and tuberculous patients were published by Cooke and Ponder,[2] and upon these frequency polygons a third, that of the Leysin cases, was superimposed. This polygon overlapped the other two and occupied an intermediate position. In other words the Arneth count shows a lesser left-handed deviation in Alpine patients than in patients in Britain. The most obvious explanation is to be found in the different environmental factors, the principal one being that of natural heliotherapy. The authors explain that the action of the sun cannot be merely a stimulation of hæmopoietic function, since that would cause either a more left-handed deviation of the count, or if the removal of polymorphs increased proportionately, a continuation of the status quo. The difference of the frequency polygons is so distinct that this cannot be the case, and the only simple explanation is that the average life of the polymorph is prolonged—i.e., that removal from the circulation is not so rapid. Possibly, too, the sun's action results in more viable leucocytes being formed which, although produced by the marrow under the unfavourable influence of tubercle toxin, compare favourably with those produced under a similar handicap but without the beneficial adjuvant of natural heliotheropy.. It may be that antibodies are formed more readily under Alpine conditions and that vitamin D plays a part in the interactions.

Tissue Surgery and the Arneth Count.

The effect of tissue injury on the Arneth count has been studied by Dr. M. Danzer. of Washington Square, College, New York University, who finds the Arneth count deflected to the left in a variety of conditions, by such substances as thyroxine, colchicine and nucleic acid, by exposure to X rays and ultra-violet light, burning of the skin, crushing of bones or deep parts, as well as in every variety of microbic infection. Rather than postulate that each of these conditions results in stimulation of the marrow in a specific manner peculiar to itself, the author has sought for a particular substance or group of substances produced under all the conditions mentioned and capable of stimulating the marrow, to the presence and action of which the deflection of the count might be ascribed. The injection of extracts of muscle, brain, liver, and testis caused, in five hours, a marked left-handed deflection comparable with the deflection following the injection of 1 mg. of nucleic acid. A striking result was obtained by the injection of washed hæmolysed red corpuscles taken from and injected subcutaneously or intravenously into the same rabbit. In five hours the total leucocytes were double the previous numbers and the polynuclear count more

[1] Deut. med. Woch., 1904, xxx., 54.

[2] Cooke, W. E., and Ponder, E.: The Polynuclear Count, London, 1927, p. 69.

markedly deflected than with any other substance. Deproteinised extracts produced no deflection of the count. It is a reasonable assumption that the leucopoietic stimuli in these cases are proteins or substances allied to proteins. If they are proteins it is quite possible that they require to be broken down or otherwise transformed in the body before they can produce their effect because the deflection of the count by these tissue extracts is more slowly produced than by nucleic acid or thyroid extract. Except for the delay of three hours, the results are, however, exactly similar. The effect of destruction of tissues in vivo was next studied. Most anæsthetics—chloroform, ether, and chloralose—deflect the count, but it was found that ethyl urethane had no effect on it in rabbits. Under this anæsthetic muscle was destroyed by crushing, bones were fractured, and extensive superficial burns produced. The polynuclear count was deflected in exactly the same manner as in the former experiments. The author suggests that the continual and normal breakdown of tissue in the body is sufficient to provide a stimulus for the continual and normal output of polymorphs by the marrow.

Irradiated Ergosterol and the Count.

In the last paper of the series, in which Dr. D. R. Climenko reports on the deflection of the count by irradiated ergosterol, the experiments of Kennedy and Thompson are repeated, and the effects of injection of irradiated ergosterol in maize oil, separately and in conjunction with ultra-violet light, are studied in relation to the Arneth count and the calcium content of the blood. The result of ten minutes' exposure to the mercury-vapour lamp was the deflection of the count in the manner described by Kennedy and Thompson plus an appreciable but temporary increase in the blood calcium. The increase in the calcium content was not of the same order as that produced by large doses of irradiated ergosterol, but the deflection of the count was closely comparable in both series of experiments. The combination of irradiated ergosterol and direct radiation produced an additive effect on the blood calcium, an increase from 11·2 mg. to 17·4 mg. in 24 hours being noted. In the controls no deflection of the count nor alteration in the blood calcium level was produced either by filtered ultra-violet light or by non-irradiated ergosterol. These studies on the Arneth count have elucidated many points in connexion with the nucleus of the polymorph and led to a better understanding of the nature of the marrow reaction. The importance to practical medicine is apparent and illustrates once again the advantages of co-operation between physiologists and clinicians.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

JUVENILE EMPLOYMENT.

AFTER a long experimental period of juvenile advisory committees, the Scottish Education Department have issued a model constitution for such committees: they should have a chairman appointed directly by the Ministry, four representatives of the local education authority (or authorities) concerned, four teachers nominated by the Educational Institute for Scotland (representative of primary, advanced division, and secondary schools), six employers' representatives, six workpeople's representatives, and four other persons interested in questions relating to the employment and welfare of boys and girls. This constitution is variable according to local necessity. The committee's duties will be: (1) the advising of boys and girls between school-leaving age and the age of 18 on the selection of a suitable career; (2) rendering of assistance to boys and girls in obtaining employment; (3) the supervision of the boys or girls during the early stages of their industrial life as may be found necessary. The school-leaving cards must contain: a statement of the educational standard attained by the child, an expression of opinion by the head or other teacher on the child's aptitude for the work desired, and any material particulars of the child's medical history. Need for after-care or industrial supervision should be indicated by the head teacher, and reports should be furnished on all children about to leave school.

It is expected that this will result in a closer coöperation of the labour authorities and the education authorities. Conferences in schools are suggested.

THE PROGENY TEST.

Mr. A. D. Buchanan Smith, of the Animal Breeding Research Department of the University of Edinburgh, made some important points in a recent lecture on the progeny test. Now that milk is growing in use as a food, quantity becomes very important, and, in selecting good milkers, breeders must take account of the father as well as of the mother of his cows. Mr. Smith said that of the bulls used in the pedigree dairy herds of this country 85 per cent. were sent off to the butcher before their daughters came into milk. The only way that the value of a dairy cow could be estimated was by measuring the milk she produced, and until the daughters were in milk it was next to impossible to get any idea of the value of the bull they were using. This value was proved when the yields of the daughter of a bull were better than the yields of the dams of the daughters, allowing for the fact that a heifer's yield was only four-fifths of her mature yield.

RADIOLOGY AT GLASGOW.

The formal opening of the new radiological department at the Western Infirmary is an event of major importance to the Glasgow medical school. The Infirmary was one of the first institutions to make use of X rays for diagnostic purposes, and its work in ten years has increased from 6000 to over 19,000 exposures a year. The situation of the Infirmary is one of the finest in Scotland, and the new department benefits by this fact. It forms an important unit in the hospital's organisation as the national radium centre. Dr. C. O. Hawthorne, who gave an address at the opening ceremony, spoke of certain tendencies in present-day medicine. Bedside studies were being reinforced by laboratory investigations, but it was on these studies that the great bodies of fact and doctrine rested. The notion that a patient's ills and requirements could be determined by some form of scientific test made in a laboratory by an observer who had never seen the sick man was only less fantastic than the claim that a film of blood on a blotting paper could reveal the pathological disturbances of which the patient was the victim. He then sketched the enormous improvement in methods and results from the steady development in the delicacy of apparatus. On the uses of radium he spoke with scientific moderation. Whatever might be its therapeutical possibilities, radium was, he said, an element with dangerous qualities, and was not safe out of the hands of a specially trained and highly competent staff. Its value was undoubted, but like all single

and powerful remedies it had excited hopes out of all proportion to its present importance.

DR. WOODBURN MORISON'S APPOINTMENT.

There is widespread regret that Dr. Woodburn Morison should have left Edinburgh to accept a chair of radiology in London, for it is felt that the new department at the Royal Infirmary had grown up with him from the first elements of the building plan. Equipped on a scale hitherto unknown to Scottish institutions, he knew it with the intimacy that is possible only to the designer and the executive architect. Full details were given in this column when the Duke of York opened the department four years ago, and these need not be repeated. It was at a cost of £52,000 that Edinburgh redeemed the reproach that an X ray installation must be sought in a noisome cellar. I recently took an English friend over every section of the department, and he was immensely struck with the many signs of the directive intelligence that a department with so many dangerous machines demands. Prof. Morison seemed to keep alive in his brain every piece of apparatus under his care, and the enthusiasm of his officers reflected his own. All his friends in Edinburgh wish him success in his new appointment.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

GALWAY BOARD OF HEALTH.

LAST week Mr. A. P. Delaney, one of the inspectors of the Department of Local Government and Public Health, held an inquiry into the manner in which the County Galway Board of Health performed its duties. The immediate cause of the inquiry was the refusal of the Board of Health to appoint an assistant to the county medical officer of health. The former county tuberculosis officer had recently been appointed county medical officer of health, and the Board had failed to provide him with an assistant. At the inquiry the secretary of the Board of Health stated that the only reason for the refusal of the Board was the desire to save the county from being saddled with expenses it could ill afford. The proposed plan was only the beginning of a scheme which would land the county in bankruptcy. He read an opinion given by the medical staff of Galway Central Hospital which expressed disapproval of the proposed scheme. There were 367 schools in the county, and to carry out a scheme of school inspection and treatment would cost over £10,000 a year. As an alternative poor children should be treated by the dispensary doctors, and the children of the rich could have treatment provided at the expense of the parents. As regards tuberculosis, the county medical officer should attend the various tuberculosis dispensaries throughout the country as part of his duties, and the staff of the Central Hospital would be responsible for the care of the County Sanatorium; or, as an alternative, the care of the tuberculosis dispensaries should be entrusted to the dispensary doctors. Dr. B. O'Beirne, county medical officer of health, stated that it was absolutely necessary that an assistant should be appointed. Since his appointment as county medical officer of health he had been unable to attend at the six tuberculosis dispensaries scattered through the county, and they had been neglected. Prof. T. Walsh, a former chairman of the Board of Health, gave evidence in support of the opinion expressed by himself and his colleagues at the Galway Central Hospital. He said that the existing machinery was adequate, and it was only a question of coördinating it. To inspect schools was useless unless treatment was provided for all defective scholars. An effective scheme would require the services of four or five additional doctors, and he did not think that this expense was justified. At the moment the great difficulty in County Galway was poverty. The inquiry concluded after further evidence on behalf of the Board of Health.

ULSTER MEDICAL SOCIETY.

At the second meeting of the session on Oct. 30th, with Mr. Henry Hanna, the President, in the chair, Dr. R. H. Hunter made an appeal for the study of the history of medicine, and suggested that the society should try to foster an interest in this subject by opening each meeting with a short paper on some phase of this subject. He then read such a paper, on the Treatment of Wounds in the Dark Ages. At first, he said, suppuration was induced in all wounds to rid the body of evil humours, and the wound was kept open by tubes and setons. Theodoric, in 1266, tried to introduce the washing of wounds with white wine and dressing with lint soaked in wine, and so to obtain healing "by adhesions." This method never became popular, and the older method remained popular until the sixteenth century, when the margins of the wound were drawn together and kept in place with a thick paste. Until Lister introduced his antiseptic technique mediæval methods were not finally abandoned. Mr. P. T. Crymble then read a paper on the results of 36 consecutive cases of gastric ulcer treated by gastrectomy. There were three operation deaths and one subsequent death. The follow-up showed the following results: very good, 21; good, 4; fair, 2; no reply, 5. In three cases the ulcer developed in the presence of a gastro-enterostomy. Mr. Crymble brought forward a number of arguments in favour of gastrectomy for gastric ulcer: (1) it reduces acidity; (2) the ulcer-bearing area is removed; (3) it offers the safest and easiest means of dealing directly with an adherent ulcer; (4) not only is the palpable ulcer removed, but the excised portion is often found to be the seat of gastritis or a second ulcer; (5) the danger of leaving a cancerous ulcer is eliminated; (6) the danger of jejunal ulcer is almost completely eliminated; (7) the ultimate results are very good, and the patient with a small stomach can lead an ordinary life. In 33 of the cases a retrocolic end-to-side gastro-jejunostomy was done, and in three an antecolic end-to-side gastro-jejunostomy.

THE LADY CHICHESTER HOSPITAL.—This institution for women and children at Hove is this year keeping the twenty-fifth anniversary of its establishment. It was the first hospital in England for patients seeking treatment on a purely voluntary basis for early nervous and borderland maladies. Patients, who are admitted simply upon a medical recommendation, pay according to their means up to a maximum of £3 10s. per week, but no one is refused admission on the ground of inability to pay. There are 53 beds; the average annual admission-rate is 175; and of 100 consecutive cases 73 were discharged fit to return to their ordinary life. A new annexe has been provided for the accommodation of patients of both sexes in connexion with an out-patient department for early nervous and borderland cases at the Sussex County Hospital, Brighton, and an appeal is being made for the means to pay off debt and defray the cost of the new accommodation.

PUBLIC HEALTH SERVICES

MENTAL HOSPITAL REPORTS.

The DEVON MENTAL HOSPITAL publishes an illustrated report with photographs of some of the industries which keep the patients employed. There were 1311 patients on the register at the end of last year, and the shortage of accommodation on the female side became acute. The recovery-rate was 43·04 per cent., the highest figure for 30 years. The death-rate was 8 per cent.—a slight increase accounted for by 10 deaths from malignant disease and 6 from epilepsy. Post-mortem examinations were made on 65·3 per cent. of the cases. There was no typhoid or paratyphoid and these diseases seem to have been eradicated; routine inoculations have, therefore, been discontinued. There were four cases of dysentery, and 12 patients suffering from general paralysis were treated with malaria. Four of them have been discharged and three show improvement. In three cases an unsuccessful attempt was made to induce malaria with sporozoites from the salivary glands of the mosquito, sent in blood serum through the post. Ten of the cases received tryparsamide injections in addition to malaria inoculations. The results were encouraging. The total of paralytic patients treated by malaria is now 40, and the medical superintendent gives an account of one successful juvenile case. Three cases of piles and one of varicose veins were treated by injection. The visiting surgeon examined 68 patients and performed 30 major operations. The visiting ophthalmic surgeon examined 83 cases, and the dental surgeon saw 822 patients at his fortnightly visits. Ultra-violet light treatment was given to 36 patients with benefit. It does not, however, seem to suit epileptics or agitated melancholics. The consulting radiologist made 56 examinations. The laboratory was busy with the usual investigations, and the out-patient clinic at Exeter increased its annual attendance from 63 to 130. To give adequate service both to new patients and after-care cases the fortnightly sessions will have to be changed to weekly ones. A water-aerating plant was purchased in June, and in six months had effected a saving of £8 on the purchase of syphons of soda and lemonade. An average of 139 patients daily had parole within the estate, while 50 more were allowed outside and 25 were taken out by friends for short periods. The open-door system and club-ward system are also freely adopted. Practically all the printing required in the hospital is done in the shop, and other patients are employed on bookbinding, weaving, net-, mat-, brush-, basket-, and rug-making, knitting, and raffia work. Nurses are now required to sign an agreement to take a three years' course of systematic instruction which qualifies them to sit for the examinations of the General Nursing Council. One sister attained her double qualification last year, three nurses and one attendant passed the final G.N.C. examination, and ten nurses and two attendants the final R.M.P.A. examination. There is urgent need for better accommodation for the nursing staff.

The report of the Asylums' Committee for the CITY OF BIRMINGHAM states that there were 2730 patients under their care at Winson Green on March 31st, 1930. The recovery-rate for the preceding 12 months was 45 per cent.; 48 of the 77 patients discharged recovered were allowed out on a month's preliminary trial, 32 of them with financial help. The death-rate was 7·35 per cent., and post-mortem examinations were made in 93 per cent. of the deaths. The general health was satisfactory, except for an influenza epidemic in the spring. Two male patients and one female were suffering from tuberculosis at the end of the year, and one attendant was attacked with diphtheria; otherwise there was no infectious disease. The visiting ear, nose and throat specialist examined 162 patients, and found chronic septic conditions in the majority. The visiting gynæcologist examined 92 women, many of whom needed treatment for inflammatory conditions or displacements. The visiting dentist examined all new admissions. The results of treating chronic focal sepsis have continued satisfactory. Protein therapy by means of T.A.B. vaccine was given to 52 patients, and nine were treated by malaria for general paralysis. Artificial sunlight was used during the winter. Useful employment was provided for 65·5 per cent. of the patients, and parole was freely granted; 60 per cent. of the staff hold the R.M.P.A. certificate.

At RUBERY HILL AND HOLLYMOOR there were 1373 patients on Dec. 31st, 1929. The recovery-rate was 40·7 per cent., and the death-rate 7·73 per cent. Autopsies were carried out in 49·2 per cent. of the deaths. Influenza took a toll inside as well as outside the hospital during the early part of the year, and a large number of patients suffered from the epidemic. Only two patients are known to be suffering from tuberculosis, and intestinal diseases have been entirely absent. Routine examinations of new admissions often reveal the fact that the patients have suffered from intestinal infection, and this factor is believed to reduce the resistance to septic infections. A small epidemic of diphtheria occurred in the summer, and was soon traced to a carrier. The dairy herd has twice been tested for tuberculosis with no positive results. During the year five attendants and 19 nurses passed their final R.M.P.A. examination, bringing the total certificated to 86 attendants and 66 nurses.

The MONYHULL COLONY for feeble-minded and epileptic children had 1206 cases in residence on March 31st last. There was a death-rate of 12·7 per 1000, about half the deaths being due to epilepsy; 12 cases of tuberculosis have been under treatment and, apart from mild influenza, there has been little infectious disease. Leave of absence was granted to 1367 patients during the year, a larger number than formerly, and on the whole the leave regulations were fairly well observed. As in all institutions of this kind, there is acute pressure of accommodation, which is bound to interfere to some extent with the classification of patients. The dental condition of the colonists is now very satisfactory, and the work of the dental surgeon is showing its good effects in better health generally. All the workshops were busily occupied during the year, and the industries were developed as far as possible. On an average 394 men and 460 women were regularly employed, and over 36,000 articles were made and 65,000 repaired. Pathological investigations are made for the colony at the Hollymoor laboratory. During the year eight nurses passed the final examination of the R.M.P.A., so that there are now 32 nurses and 35 attendants certificated or State registered.

At the RESIDENTIAL SCHOOL there were 329 patients on March 31st. The average age of the children on admission is between 5 and 10. It is much better that they should come early, but there has been a certain amount of congestion in the junior classes. The children are under daily medical observations in the home, and a consulting staff is available when required. The dental surgeon examined all new cases, and makes periodical inspections. Two nurses attained their R.M.P.A. certificate during the year, bringing the total to 11 certificated or registered.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 1ST, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 87 (last week 86); scarlet fever, 2301; diphtheria, 1520; enteric fever, 42; pneumonia, 698; puerperal

fever, 48; puerperal pyrexia, 102; cerebro-spinal fever, 11; acute poliomyelitis, 9; acute polioencephalitis, 3; encephalitis lethargica, 12; dysentery, 5; ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Nov. 4th–5th was as follows:—Small-pox, 183 under treatment, 3 under observation (last week 172 together); scarlet fever, 1803; diphtheria, 2198; enteric fever, 17; measles, 90; whooping-cough, 105; puerperal fever, 22 (plus 10 babies); encephalitis lethargica, 121; "other diseases," 43. At St. Margaret's Hospital there were 11 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 3 (0) from enteric fever, 15 (1) from measles, 6 (1) from scarlet fever, 10 (1) from whooping-cough, 32 (2) from diphtheria, 62 (20) from diarrhœa and enteritis under two years, and 41 (9) from influenza. The figures in parentheses are those for London itself.

The fatal case of small-pox was reported from Stepney Met. Boro. Bristol and Hull each reported 3 deaths from measles; Worcester, Birmingham, and York each 2. Four fatal cases of scarlet fever were reported from Leeds. Liverpool reported 4 deaths from diphtheria, Manchester and Dewsbury each 3. Diarrhœa accounted for 6 deaths at Liverpool, 3 each at Birmingham and Nottingham. Birmingham also reported 7 deaths from influenza.

The number of stillbirths notified during the week was 261, corresponding to a rate of 40 per 1000 births, including 47 in London.

DEATH FROM SMALL-POX.

The fatal case of small-pox reported in the metropolitan borough of Stepney was that of a dock labourer, aged 58 years, who was admitted to St. George-in-the-East Hospital on July 8th, and removed on Aug. 4th to Joyce Green Hospital, where he died on Oct. 31st. Dr. J. M. Browne, medical officer of health for Stepney, informs us that the cause of death was certified as (1*a*) myocarditis; (2) small-pox. The man had been vaccinated in infancy. There was no autopsy.

OBITUARY

ROBERT LINDSAY, L.D.S. Edin.

Mr. Robert Lindsay, who died on Nov. 4th, had been the dental secretary of the British Dental Association for 11 years, and his loss both to the Association and to the dental profession as a whole is a severe one. Before taking up this appointment he was in practice in Edinburgh, where he had held a teaching post in connexion with the Edinburgh Dental School. As the first full-time dental secretary of the association he found scope for his powers of organisation, his great energy, and his detailed knowledge of every phase of dental work.

MR. ROBERT LINDSAY.

The passage of the Dentists Act, 1921, created many difficulties, for it legalised the position of the large number of unqualified practitioners. The Dentists Register established by the newly formed Dental Board included both qualified and unqualified dentists, and the latter were in a large majority. This Act, though plainly inevitable, was bitterly resented by many qualified dentists, and a split was threatened in the ranks of the British Dental Association. Lindsay performed valuable work in averting such dissension, and the fact that the Association surmounted this difficulty and went on increasing in strength was largely due to his shrewd tactical sense. The institution of panel dentistry as an additional benefit under the National Health Insurance Act was another change which has been of great value to the community as a whole, but has created delicate problems calling for tact and persuasiveness. It was necessary to establish a scale of fees acceptable both to the insurance societies and the dental profession. The difficulties of negotiation were enhanced by the fact that the societies had to deal both with the British Dental Association, representing the qualified dentists, and with the various bodies to which the unqualified but registered practitioners belonged. In the end these difficulties were surmounted, though not easily. "It would be hard to speak too highly of the work which Lindsay carried out in this connexion," writes a colleague. "Much of it was done behind the scenes, and the full extent of his labours is known only to a few. But the dental profession has cause to be deeply grateful to him. He was an excellent speaker and his retentive memory enabled him to deal with a complicated mass of details without a note. Though a complete master of the innumerable details constantly arising in his work, yet he had a broad outlook and always took a statesmanlike view of any problem under discussion. Personally, he was a man of simple tastes. Austerity and kindness were happily blended. His criticisms could sometimes be pungent but were always devoid of malice. He served the British Dental Association with single-minded loyalty, and by all its members and by many others outside its ranks his death will be deeply mourned."

CHRISTIAAN EIJKMAN, M.D.

Prof. Eijkman, who has died at Utrecht, laid many of the foundations of our present knowledge of deficiency diseases, and shared with Sir Gowland Hopkins the Nobel Prize for Medicine in 1929.

The son of a schoolmaster, Eijkman was born in 1858, at Nijberk, a small town on the Zuyder Zee. He began his studies in 1875 at the University of Amsterdam, and was for some years assistant to the professor of physiology there. In 1883 he joined the colonial army in the Dutch East Indies, but he was invalided home two years later and resumed his laboratory work, this time as a bacteriologist. In 1886 he returned to the Dutch East Indies as a member of a study commission on beri-beri, which at that time was raging in the Dutch colonial army and navy. The ætiology of this disease was then obscure and as the medical world had been hypnotised by Pasteur and his followers into thinking of disease in terms of bacteria, it is not surprising that this commission came to the conclusion that beri-beri must be an infectious disease. While his colleagues on the commission returned home, Eijkman remained in Batavia as director of the new laboratory for bacteriology and pathology and took charge also of the medical school for native doctors.

Eijkman's original research in connexion with beri-beri began in a curiously accidental way. He wished to carry out certain investigations on fowls, and in order to economise on their food he fed them

on scraps from the wards of the military hospital to which he was attached. On these scraps, which consisted chiefly of cooked, polished rice, the fowls developed paralyses, whose nature was at first obscure. A clue thereto was unintentionally given by a newly appointed director of the hospital, who refused to let Eijkman feed his fowls any longer on scraps from the wards. Henceforward they were fed on gaba (rice still in the husks) and on this diet they recovered. Eijkman's identification of this polyneuritis gallinarum with the beri-beri of human beings was at first generally scorned or ignored, but about 1896, after much painstaking research in coöperation with Dr. Grijns and Dr. Voderman, he came to the firm conclusion that a diet of over-milled rice was the chief cause both of the polyneuritis of fowls and of the beri-beri of human beings. The term "partial hunger" was given to this condition.

Other investigations into morbid conditions of the blood in the tropics led Eijkman, in the early 'nineties, to reject some of the prevalent conceptions of the nature of tropical anæmia, which at that time was held to be a nosological unit. He also challenged the assumption that human metabolism varied greatly with the different climates. He showed that the metabolism of the human body is practically identical in the tropics and in cold climates; and he came to the conclusion that acclimatisation does not mean a fundamental change in metabolism, but immunisation to a new group of infectious diseases with which the newcomer to the tropics had not previously been in contact. Among the more important research which he carried out in later years was his study of fermentation tests and the demonstration of the presence of *Bacillus coli* in water (Eijkman's test). After being invalided home in 1896 Eijkman was appointed professor of hygiene at the University of Utrecht, and he held this post till 1928, when he was in his seventieth year.

CONSTANTIN von MONAKOW.

THE death of Prof. von Monakow at Zürich at the age of 77 removes one of the founders of modern neurology. As a young asylum doctor he was attracted to the organic substratum of sensation and movement at a time when little was known even of the tracts in the brain-stem. His first work was, therefore, directed to a study of the relations of the thalamus with the higher and lower centres. For this purpose he devised the method, which in his hands gave fruitful results, of cutting tracts or removing nuclei in newly born animals and examining the brain after some months of growth to find what parts of it had failed to develop. In this way he was able to demonstrate the relationship of the various nuclei of the thalamus to different parts of the cortex, of the mesial fillet to the nuclei of the posterior columns, of the striæ acusticæ to the lateral fillet, and of the red nucleus to the rubrospinal tract. He was also the first to demonstrate clearly the relationship of the optic tract to the external geniculate body.

These early researches, while bringing him fame, set Monakow in opposition to much of the teaching of the day. From anatomical study of the brain-stem he proceeded to a study of localisation in the cerebral cortex. In this work he had to rely largely on human clinico-pathological material from which it was more difficult to reach clear-cut conclusions, but the philosophic bent of his mind made him dissent from the current tendency towards localising each function of the cortex in a circumscribed area. For him there were, indeed, areas in which the combined action of lower centres was integrated, but his knowledge of comparative anatomy and physiology enabled him to see the chronological basis of this integration. With the development of the fore-brain more and more powers of integration were relegated to it, and in lesions or disease of the cortex those which had come latest were usually the first to be lost. This chronological basis was assumed by him not only in his work on aphasia but in relation to his much discussed theory of diaschisis. This theory was an attempt to explain the widespread and severe initial loss of function which follows sudden damage to the nervous system. According to Monakow's theory the damage to the centre split or tore apart the constituent elements of a function, destroying their integration. This disturbance at first abolished the functions of the individual elements, and these were later re-established according to the chronological basis already mentioned. This theory formed the basis of an attack on the theories of cerebral localisation current at the time which was launched in his book "Die Lokalisation im Grosshirn," published in 1914.

Monakow's theories of the function of the brain tended towards a humoral basis. This was already noticeable in his theory of diaschisis, according to which the nutrition rather than the function of the lower centres was disturbed by a lesion of a higher centre. Later, he became impressed by the influence of the ductless glands on the activity of nerve-cells, and he suggested the theory that mental diseases might be due to degenerations of the choroid plexus which allowed metabolic poisons to pass through it into the cerebro-spinal fluid and thence into the brain substance. During his later years he was also engaged in formulating a system of psychology, individual and based on his own earlier work, but influenced to some extent by Bergson. This was embodied along with much other material in a book published in 1928, in association with Mourgue, "Introduction biologique à l'étude de la neurologie et de psychopathologie," a book which, in the phrase of a reviewer, "orients the neurologist and psychopathologist and provokes and compels thought."

An original thinker whose philosophic habit of thought was restrained by an untiring zeal in the quest of facts, Monakow was a constant stimulus to his students and associates. He was active in forming first a Zürich neurological and psychiatric society, and later a Swiss neurological association; in 1917, in spite of the difficulties of publication due to the war, he inaugurated the *Archives suisses de neurologie et psychiatrie* which he edited up to his death. Our memory of him is of a tall, big-hearted, kindly man, remarkably modest, in spite of his commanding position in Swiss neurology, and very appreciative of the recognition which he received from British neurologists.

WEST BROMWICH HOSPITAL.—The board of management have declined to establish a contributory fund on the ground that it desires to maintain the entirely voluntary nature of the hospital. At the annual meeting it was stated, on behalf of the medical staff, that if a contributory scheme were started they would have to ask for payment. The number of in-patients treated last year was 1373; there were 17,932 out-patients. The in-patients stayed on the average 27·10 days; the average cost of each was £8 19*s.* 2*d.*, and the average cost per occupied bed £104 15*s.* 1*d.*, as compared with £113 0*s.* 6*d.* in the preceding year.

CORRESPONDENCE

ELECTRO-SURGERY.

To the Editor of THE LANCET.

SIR,—Your leading article of Nov. 1st might give the impression that electro-surgery has made little progress in London. As a matter of fact in my own hospital practice, in that of my colleague at the Middlesex Hospital, Mr. Gordon Taylor, and doubtless at other hospitals, the electric needle has definitely replaced the scalpel for many categories of operation. For breast and mouth surgery it is at present indispensable, and you allowed me the privilege of advocating diathermy for carcinoma of the breast in your columns as far back as May, 1927. Mr. Anderson, who has done such good work in Dundee in pioneering the method, appears not to have used the diathermy needle for abdominal surgery. It will be found, in my opinion, a most satisfactory instrument for gastrectomy, lessening hæmorrhage, both operative and post-operative, from the divided mucous membrane and—what is much more important—reducing shock to a minimum. I feel bound to record, in regard to gastrectomy, my dissent from Lord Moynihan's recent statement that the technique of the operation cannot be improved upon. The use of diathermy alters the whole aspect of the post-operative period and does away with the need for special measures, such as transfusion and intravenous saline, which were required in its first days.

It would be regrettable, and very unfair to our own manufacturers, if the impression got abroad that good surgical work can be done only with a very expensive imported machine. Where direct current is available the old small Schall machine, the cost of which is very moderate, does excellent work. There are several quite efficient and not expensive alternating current machines both of English and continental make. Hospitals installing the method—and every hospital must shortly do so—should choose their machine by actual trial of competing machines in the operating theatre, should avoid the temptations of mere costliness and unnecessary ultra-refinement, and should give the preference, efficiency being equal, to an English machine.

I am, Sir, yours faithfully,

W. SAMPSON HANDLEY.

Harley-street, W., Nov. 7th, 1930.

A MEDICAL SERVICE FOR THE NATION.

To the Editor of THE LANCET.

SIR,—I am afraid that in spite of Mr. Layton's trouble I remain unconvinced. I recognise that his contention that social service is valuable is a logical result of his belief that at birth all are equal. But this assertion does not become a fact by mere assertion. I would ask Mr. Layton if he considers that the farmer believes that at birth all calves are equal? Why does the farmer spend large sums in breeding stock from animals of proved superiority in milk yielding? I am told by those who have observed under the rather rare conditions in this country that there is considerable difference at the seventh day in the expression, movements, cry, and behaviour of the child of slum parentage and a child of the "quality," nursed side by side from birth under similar conditions. What about Galton's researches into the inheritance of genius? Surely Mendelian factors have some influence in human heredity. Admitted there are few data for the human race, but they have been shown to play a part in the blood groups.

The survival of the fittest still holds good for the human race, though civilisation has done a good deal to upset the balance, but in general terms the successful adaptation to life depends on a balanced moral, mental, and physical equipment. The successive waves of invasion into the aristocracy described by Disraeli depended on the efforts of the best equipped members of the lower castes who had inherited the most valuable genes from both parents. On investigation it would be found that the other members of those families remained at their original level.

The factor of chance cannot be disregarded and must bring about some exceptions to the general rule. But in contradistinction to Mr. Layton I think it must be agreed that some individuals inherit a better equipment than others and that the progress of the race depends on these more fortunate persons. They should not be denied the opportunity of helping their more unfortunate fellows, but on the other hand they should not be hampered or crippled by demands for a luxury social service. If everyone is reduced to a general dead level in the endeavour to eliminate class distinctions the progress of the race will be endangered. As Bicket says in Galsworthy's "White Monkey," life would be a frost if the world were reduced to the level of a pound a day. The better stock would be discouraged at the deprivation of opportunities for further progress, and the poorer stock would be deprived of all responsibility or any further incentive for improvement.

I am, Sir, yours faithfully,

Bristol, Nov. 8th, 1930. FRANK BODMAN.

MEDICAL EDUCATION.

To the Editor of THE LANCET.

SIR,—There can be little doubt that the arrangement of the medical curriculum is to those in whose hands it rests an unending source of difficulty. So much to be learnt and, relatively, so little time in which it is to be taught. The outcome of the labours of these persons in authority must, from the nature of things, be rather the result of the sifting of those opinions to which they have access than the conclusions derived from first-hand experience. From this it would reasonably appear that while the advice of those who teach is easily obtained and readily given the great mass of those who are taught remain inarticulate. The students, lacking authoritative representatives, are unable to give coherent expression to their views. Consequently, the balance of opinion available to those who arrange the curriculum is unevenly struck. The opinion of experience is, admittedly, more valuable than that of inexperience. The young, notoriously, do not know what is good for them. Yet the knowledge that the student possesses of his own capabilities, desires, and ambitions renders his opinion deserving of a certain consideration. You will, therefore, perhaps allow some of your valuable space for this comment upon existing conditions.

It is obvious that, as the scope of the medical curriculum widens, compensation must be found either in increased duration of studentship or in greater concentration of study within the allotted

time. As the period of training has already been lengthened to the limits of financial endurance, a process of intensified study is the only issue out of the difficulty. This correction for the inevitable increase in medical knowledge works itself out along the following lines. For five or six years lectures and demonstrations jostle one another in close competition, and the immediate study of the patient recedes further and further into the background. The student, in his endeavour to achieve examination success, resorts to the highly vicious process of cramming. As the capacity of the mind is limited, a fairly complete knowledge of a few subjects is replaced by a smattering of knowledge of several subjects. This is, in effect, a redistribution of the available mental energy as the number of subjects to be learnt, grows. But the increase of the number of subjects carries with it an additional evil. It results in the dissipation of interest. The student's mind becomes the repository of half-digested knowledge, for the complete digestion of which there no longer exists the intellectual appetite.

The position is a deadlock. However desirable it may be for the student to be conversant with, for example, anything more than the broadest outlines of psychological or preventive medicine, the fact remains that he is incapable of absorbing more than a certain amount of knowledge in a given time. And this amount is limited, in the main, by natural ability and interest. The present lack of time enjoyed by the student for the exploitation of those lines of interest awakened by his work, allied with the consciousness that he must be continually pressing on to some other part of the syllabus, is one of the most unfortunate results of the increasing curriculum.

The solution of these problems is difficult. It is hard to see how the syllabus can be cut down or the course of training lengthened. There does, however, seem to be one weakness in the system, the correction of which would possibly result in a saving of time, and, almost certainly, in a greater maintenance of interest. The marked segmentation of the medical training into the three examination stages has two undesirable sequelæ. First, until he commences clinical work, the student tends to forget to what end he is studying any particular subject. The danger of this is increased in virtue of the fact that he is taught by specialists at every stage. The biology course may be instanced as an example of this. Here the teachers are biologists interested in experimental biology rather than in medicine. Inevitably, the student's interest becomes misdirected. He becomes temporarily a biologist in embryo, rather than a doctor in embryo. What should be the motive medical idea is for the time being forgotten. And so on, throughout the whole of the early training, in the absence of any medical thought or atmosphere, the student loses sight of the fact that he is supposed to be building a firm basis on which to found his medical knowledge. Secondly, the system results in a certain unnecessary re-covering of old ground. Anatomy and surgical anatomy do not enjoy the economical relationship to one another that would seem justifiable and desirable; similarly, medicine and physiology, pathology and histology. In fact, so frequently has this failing been pointed out that its exemplification requires no further elaboration here.

The cure lies in the application in this sphere of the basic idea of Lord Moynihan's Toronto address. A closer coördination of the teaching of the various component parts of the medical curriculum is needed. This can only be achieved by the institution of a collateral system of studying the various subjects. Under such circumstances the student would not lose sight of his ultimate goal and would almost certainly find the work easier to learn. Collateral study would satisfy the student that he was, all the time, acquiring information that would be useful to him, and by so doing would keep alive his original enthusiasm. This enthusiasm dies because the contact with actual medicine, to which the student has so long looked forward, is made too late in the training. To study the preliminary subjects in terms of the desired knowledge would stimulate interest in both of them.

I am, Sir, yours faithfully,

London, W., Oct. 27th, 1930. DONALD BATEMAN.

INJECTION TREATMENT OF SIMPLE GANGLION.

To the Editor of THE LANCET.

SIR,—Mr. P. McEvedy, who described in your issue of Oct. 25th (p. 902) a method of treating simple ganglion by injection with sodium morrhuate, might be interested in the following case.

A healthy young man consulted me for a swelling of his left pinna which for all the world looked like a hæmatoma, but there was no history of even a slight injury and trans-illumination showed that the contents were not opaque. With a minute injection into the skin of sterinovo, I aspirated the cyst, withdrawing a yellow fluid, which was found to be sterile and contained a few red blood corpuscles, evidently serum. Three or four days later the swelling had reformed. This time I adopted the same procedure, only after aspiration I injected, through the same needle, 1 c.cm. of quinine urethane — just half the amount of the fluid aspirated. The condition was quite painless except for a little "tingling irritation" after two or three days, and in less than ten days the pinna was completely restored to its normal shape.

I am, Sir, yours faithfully,

WRIGHT LAMBERT, M.R.C.S., L.D.S.

Brentwood, Essex, Nov. 8th, 1930.

HÆMATOPOIETIC PROPERTIES OF DRIED MILK.

To the Editor of THE LANCET.

SIR,—I am grateful to Dr. Taylor for affording me this opportunity to make clear what might appear an omission. Dr. Helen McKay's exceedingly interesting paper described the administration of quantities of iron—up to nine grains or more per diem per infant—that amount to medicinal doses. My investigation was primarily concerned with a possible nutritional deficiency, and the means of remedying it.

Cow's milk contains little more than half the milk sugar of human milk. This deficiency is well recognised and is made good in infant feeding by the addition of sugar or by the use of a humanised food. The work I cited indicates that cow's milk is also deficient in iron. Many practitioners would, I think, wish to make good that deficiency also, since it only amounts to one-thirtieth grain per pint, though they might hesitate to give several grains of iron and ammonium citrate as a daily routine to an infant. My own experiments were solely intended to discover whether this could be achieved by drying the iron in with the milk.

The downward trend of the hæmoglobin content in the rats towards the end of the experiment is what is normally observed with increasing age. At the end of the experiment the animals were more than half-way

towards maturity. A similar fall is known to occur in human blood.

I am, Sir, yours faithfully,

A. L. BACHARACH.

Glaxo Research Laboratory, Osnaburgh-street, N.W., Nov. 10th, 1930.

IRRADIATION OF GERM-CELLS AND FŒTUS.

To the Editor of THE LANCET.

SIR,—In your leading article of Oct. 11th (p. 806) you have overlooked the work of Dr. Leopold Goldstein, of Philadelphia. Among those of Murphy, Archenheim, Stettner, Quin, Driessen, Lacassagne, and Seynsche his name seems to me worthy of mention. I append a list of his contributions to the literature of this subject.

I am, Sir, yours faithfully,

HYMAN I. GOLDSTEIN.

1. Radiogenic Microcephaly (19 recorded cases, ophthalmic defects). Arch. Neur. and Psych., July 1930, p. 102.
2. Micromelia in a Child Irradiated in Utero. Surg., Gynec., and Obstet., Jan., 1930, p. 79.
3. Amer. Jour. Obst. and Gynec., 1929, xviii., 189; Microcephalic Idiocy, with D. P. Murphy. Ibid., 696.
4. Amer. Jour. Roentgen and Radium Therapy, 1929, xxii., 322 (N.Y.C.).
5. Ibid., p. 207.
6. Ovarian Irradiation. Amer. Jour. Obst. and Gynec., 1928, xvi., 547.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

Protection of Dogs Bill.

IN the House of Commons on Wednesday, Nov. 5th, Sir R. GOWER introduced the Protection of Dogs Bill, a measure to prohibit the vivisection of dogs. The Bill was supported by Lieut.-Colonel Moore, Mr. Freeman, Lieut.-Commander Kenworthy, and Mr. Markham.

School Attendance Bill.

On Thursday, Nov. 6th, Sir C. TREVELYAN (President of the Board of Education), in moving the second reading of the Education (School Attendance) Bill, asked what could be more extremely important than giving another year of school life to 500,000 children? The object of the present great reorganisation of the educational system was to ensure a real education between the ages of 11 and 15 in schools devoted to that purpose. In general there was agreement as to most of the principles of that reorganisation. A definite and important part of the reorganisation proposed by the Hadow Committee, and which was being prepared for now by the local education authorities, was the raising of the school leaving age. In the educational world there was hardly an effective challenge to that proposal with the exception of Lord Eustace Percy, the former President of the Board of Education. What was good enough for the children of the well-to-do was surely good enough for the children of the working-classes. If this Bill was passed the change could be affected in April, 1931. The Bill was more liberal to the claimants for maintenance grants than the proposals made by the Committee of the Local Education Authorities in the past summer. The parents who claimed these grants would be required to make a simple declaration of income. That declaration could be challenged in Court, and, if false, the parent could be severely punished. In fixing the income limit he had taken a standard which was sufficiently high to include all wage-earning families where by any stretch of argument the need could be regarded as considerable. This Bill was the charter of the average child. Much of the most vigorous talent lay dormant until 14 or 15. More and more it was upon the average child that the future of the nation depended.

Lord EUSTACE PERCY, in moving the rejection of the Bill, said that one of the admitted needs of the present day was that by every possible means they should maintain the purchasing power of the masses of the people and maintain the employing part of what he might call the employing classes. The country had got to the stage where any reduction of income of any class in the community was reflected, either in the reduction of purchasing power, or in the reduction of employing power. According to Sir C. Trevelyan's figures—which he (Lord E. Percy) thought were an under-estimate—after paying the maintenance allowances to the parents they were reducing the weekly budget of some 300,000 families in this country by 7*s.* per week; and in the second place they were increasing the taxation on the employing classes by at least £7,000,000 to £9,000,000 a year. This would lead to more unemployment.

EFFECT ON SCHOOL CHILDREN'S HEALTH.

Dr. FORGAN, supporting the Bill, said he would like to refer to its effect on the health of the children of the nation. It was generally admitted that the school medical service had been responsible for considerable improvement in the health of the children. Unfortunately from the school leaving age of 14 until 16, a period in the lives of boys and girls when they became young men and young women and were specially in need of medical attention and supervision, there was no State provision for the care of the health of these young persons. The fact that this Bill would extend the school medical service to some 500,000 boys and girls would be a positive benefit which would mean in time to come a direct financial saving. From the medical point of view he heartily supported the measure.

Dr. VERNON DAVIES said that he was a great supporter of education, but he recognised that education had two distinct purposes—first, to educate the child so as to make him a decent intelligent citizen, and secondly to fit him to earn his living. If these children were going to be kept at school for an extra year were they and the community generally going to benefit? Could the workers and the industries of the country afford this Bill? The Government were the custodians of the public purse, and members of Parliament were not sent to that House to squander money. He submitted that at the present time the country could not afford the expense entailed by this measure.

Dr. HASTINGS said that in a comparatively few years they had provided for every child in the elementary schools not only medical inspection, but medical treatment as well. In some cases that medical treatment was admirable, but in other cases it was not so good. The result of this inspection had been to show that there was a tremendous amount of disease among the children. He had looked up the figures in the report of the Chief Medical Officer of the Board of Education, and in 1928 over 20 per cent. of the children had defects needing treatment other than for teeth, and 67·5 per cent. needed dental attention. There could be no doubt about the admirable results of the treatment that had been given. In his report for 1923 the Chief Medical Officer took up the question of deafness, and in London the amount of deafness in 10 years among children in elementary schools had decreased to one half. The report gave details showing that even better results were being obtained in Cambridge, Exeter, and elsewhere. But children coming to school at the age of 5 showed no decrease in the amount of ear disease. When the children took

their place in industry they had the panel medical service, and that had been of value from a public health point of view, and had provided medical treatment for a large class of people who never before obtained it. His point was that between the termination of treatment by the school meuical service and the commencement of that given by the national insurance service there was a gap. That gap came at a very critical time in the life of the child when he earned poor wages and sometimes no wages at all. A child at 14 or 15 did not realise the importance of the early treatment of disease, and frequently put things off as long as he could. He had asked the President of the Board of Education that day whether it was not possible to do something to close that gap by passing on the records obtained from the inspection of school-children to the panel committee. It seemed to him that if they increased the school age, even by a year, they would do a great deal for public health by adding an extra year's preventive treatment to the lives of the great mass of the nation's children.

After further debate,

Mr. MORGAN JONES (Parliamentary Secretary to the Board of Education), replying to the debate, said that he was confident that if the measure was accepted by the House the nation would be able to secure that the coming generation, strong in physique and alert in intelligence, would be able to carry the national burden in the days of difficulty and complexity, which no doubt lay before us, on to a prosperity greater perhaps than we now dared hope.

The Bill was read a second time by 294 votes to 227 —Government majority 67.

HOUSE OF COMMONS.

WEDNESDAY, NOVEMBER 5TH.

Experiments on Living Animals.

Mr. BROMLEY asked the Home Secretary if he had had his attention drawn to a recent case where a science teacher at Haverthwaite illustrated a lesson to his pupils by the vivisection of a cat, which he had chloroformed for the purpose; whether the teacher had a licence to vivisect, and also if the school where the incident took place was a registered place under the Act of 1876; and if he would take steps to prevent such practices.—Mr. SHORT replied: My hon. friend has been misinformed; there was no vivisection in this case. The animal was painlessly killed, and next day its body was brought to school and dissected. Such proceedings are not within the Act and require no licence, and my right hon. friend has no power to take any action in the matter.

An Overdose of Medinal.

Viscount ELMLEY asked the Home Secretary whether he proposed to take any action with regard to the evidence given at a recent inquest in Liverpool on a woman who had died from an overdose of medinal.—Mr. CLYNES replied: Under the existing law I have no power to take any action in this matter, but the Government have under consideration the question of introducing legislation to give effect to the recommendations of the recent Committee on the Poisons and Pharmacy Acts, one of which was to the effect that power be given to prohibit by rule the sale of certain poisons, except on a medical prescription.

Housing Progress.

Mr. DAY asked the Minister of Health the number of houses completed in England and Wales during the year ended to the last convenient date, giving the number of these houses separately that were completed in the London area.—Mr. GREENWOOD replied: The number of houses of a rateable value not exceeding £78 (£105 in the Metropolitan Police District) completed during the year ended March 31st, 1930, in England and Wales was 202,060, of which 5718 were completed in the County of London, or on estates of the London County Council outside the county boundary.

Sir KINGSLEY WOOD asked the Minister of Health the number of houses finished under the various Housing Acts each quarter since June 1929; and the number of houses during the same period erected without State assistance.—Mr. GREENWOOD replied: The following statement gives the desired particulars so far as State-assisted houses in England and Wales are concerned:—

Quarter ended—	Housing, Town Planning &c. Act—		Housing (Financial Provisions) Act, 1924.
	1919.	1923.	
Sept. 30th, 1929 ..	18	39,227	17,730
Dec. 31st, ,, ..	14	—	14,507
March 31st, 1930 ..	—	—	10,571
June 30th, ,, ..	—	—	11,351
Sept. 30th, ,, ..	—	—	14,881

Returns as to houses erected without State assistance are obtained half-yearly only, to the end of March and September respectively. The number of such houses of a rateable value not exceeding £78 (or £105 in the Metropolitan Police District) erected during the six months ended September, 1929, was 38,298, and during the six months ended in March last, 53,393. Complete figures for the six months ended in September last are not yet available.

Sir KINGSLEY WOOD asked the Minister of Health to give the latest returns showing the progress under the Housing (Rural Workers) Act, 1926.—Mr. GREENWOOD replied: Up to the end of June last, the latest date to which complete information is at present available, assistance had been promised under the Housing (Rural Workers) Act, 1926, in respect of 3308 dwellings in England and Wales. Work had been finished on 2206 dwellings, and was in progress at that date on a further 818 dwellings.

Mr. RAMSBOTHAM asked the Minister of Health whether the housing shortage was definitely at an end; and, if not, where such shortage existed in acute form.—Mr. GREENWOOD replied: It is common knowledge that there is still a widespread shortage of working-class houses. I shall be better able to judge its local incidence in presence of the results of the survey prescribed by Section 25 of the Act of 1930, to be made by local authorities.

Slum-clearance Schemes.

Sir KINGSLEY WOOD asked the Minister of Health the number of slum-clearance schemes since March 31st, 1930, to the last convenient date, confirmed, completed and in course of execution at the end of such period, respectively.—Mr. GREENWOOD replied: At June 30th, 1930 (the latest date to which complete figures are at present available), 71 slum-clearance schemes remained to be completed in England and Wales. Two such schemes were completed between March 31st, 1930, and June 30th, 1930, and none was confirmed during that period.

Sir KINGSLEY WOOD asked the Minister of Health the number of buildings which had since March 31st, 1930, been acquired by local authorities in connexion with approved slum-clearance schemes.—Mr. GREENWOOD replied: The number acquired in England and Wales between March 31st, 1930, and June 30th, 1930, the latest date to which complete figures are at present available, was 463.

Factory Conditions in East London.

Major NATHAN asked the Home Secretary whether he had received the report of the chief inspector of factories as to conditions in many workshops and factories in the boot and shoe industry in East London.—Mr. CLYNES replied: Recent reports by the factory inspectors on all the factories and workshops now working confirm the previous inquiries, the result of which I gave in my reply to my hon. friend the Member for Frome on June 5th last. They show

that it is only in a very small proportion of the works—about 10 out of a total of 172—that poor or bad conditions prevailed. About one half are definitely reported on as good, while the remainder reach on the whole a satisfactory standard. In all cases where irregularities were found action has been taken to enforce the Act, and the conditions are reported to have much improved.

School Medical Records.

Dr. HASTINGS asked the President of the Board of Education whether in view of the importance of medical records in connexion with the prevention and cure of disease, he was willing to authorise local education committees to transfer to local insurance committees, when so requested, copies of the medical records of children leaving school.—Sir CHARLES TREVELYAN replied: In view of the administrative difficulties involved, and the interval which is likely generally to elapse between the age at which a child is last medically inspected in school and the age at which the first application for medical benefit is made, I am not at present satisfied that I should be justified in advising local education authorities to make so important a departure from the existing practice. In this connexion I would remind my hon. friend that the Board have always impressed upon local education authorities the importance of securing that the school medical records are treated as strictly confidential.

Dr. HASTINGS: Have any applications been received for these records?

Sir C. TREVELYAN: I am not aware of any.

MONDAY, NOV. 10TH.

Preliminary Opium Conference.

Mr. MANDER asked the Home Secretary if he could make any statement as to the progress and the proposals made at the preliminary opium conference recently opened in London.—Mr. CLYNES replied: I am informed that considerable progress has been made with the consideration of the matters referred to the preliminary conference, and that it is hoped to submit a report in the course of a few days.

Use of Poison Gas in Warfare.

Mr. GRAHAM WHITE asked the Secretary for Foreign Affairs the names of States which had formally pledged themselves, by treaty or otherwise, to abstain in future from the use in war of asphyxiating or poisonous gases or liquids or similar noxious substances; and the names of States, if any, which had further pledged themselves to coöperate in the prevention by international action of the use of such substances in warfare.—Mr. HENDERSON replied: Twenty-seven States have both signed and ratified the Geneva Protocol of June 17th, 1925. Nineteen other States have signed, or otherwise acceded to, this Protocol, but have not yet ratified it. All States bound by the Protocol undertake to exert every effort to induce other States to accede to it. The following States have both signed and ratified the Geneva Protocol of June 17th, 1925: Austria, Belgium, United Kingdom of Great Britain and Northern Ireland, Canada, Australia, New Zealand, Union of South Africa, Irish Free State, India, China, Denmark, Egypt, Finland, France, Germany, Italy, Liberia, Persia, Poland, Portugal, Roumania, Spain, Union of Soviet Socialist Republics, Sweden, Turkey, Venezuela, Yugoslavia. The following have signed, or otherwise acceded, but have not yet ratified: Abyssinia, United States of America, Brazil, Bulgaria, Chile, Czecho-Slovakia, Estonia, Greece, Japan, Latvia, Lithuania, Luxembourg, Netherlands (including the Netherlands Indies, Surinam, and Curacao), Nicaragua, Norway, Salvador, Siam, Switzerland, Uruguay.

War Pensioners and Institutional Treatment.

Mr. D. G. SOMERVILLE asked the Minister of Pensions the number of men wounded in the war for whom his department still provided institutional treatment.—Mr. ROBERTS replied: The average number of disabled ex-Service officers and men (apart from cases of mental disease in mental hospitals) for whom my department is providing institutional treatment, whether for wounds or diseases, is, in round figures, 4000. The number of cases of wounds requiring treatment cannot be separately stated, but about one-fourth of the whole number are in hospital for surgical treatment.

Closing of Bellahouston Hospital.

Mr. STEPHEN asked the Minister of Pensions when he proposed to close Bellahouston Hospital, Glasgow; and what steps he proposed to take to provide for the large number of ex-Service men in Glasgow and the West of Scotland in need of hospital treatment.—Mr. ROBERTS replied: After careful consideration I have decided that Bellahouston Hospital cannot justifiably be maintained beyond a date early in the new year, so that the premises may be handed back to the Red Cross and the necessary reinstatements completed by the date of the expiry of the lease. I have arranged with the committee of Erskine House for the use of that hospital for the type of case at present treated at Bellahouston. The patients will be under the care of the same surgeon as heretofore. I have also made arrangements with the Glasgow Royal Infirmary for the immediate admission of any case requiring urgent emergency treatment. All out-patients will be treated at the Glasgow Area Clinic.

Ophthalmic Treatment of School-children.

Mr. DAY asked the President of the Board of Education the number of children provided with spectacles in England and Wales under the arrangement made by education authorities for the 12 months ended to the last convenient date; and the number of authorities in England and Wales who had not the services of an experienced oculist.—Sir CHARLES TREVELYAN replied: Some 140,000 children were provided with spectacles during the year 1929, under arrangements made by education authorities in England and Wales. All local education authorities have the services of an experienced oculist, except the authority for the Isles of Scilly, where the circumstances are, of course, exceptional.

Diphtheria in Kohat.

Colonel HOWARD-BURY asked the Secretary for India whether he was aware that diphtheria had been prevalent in Kohat for a year, and that the disease had been almost entirely confined to British officers and their families, and whether any steps had been taken to trace the disease to its source and to prevent its future recurrence.—Mr. WEDGWOOD BENN replied: I have not received any information on the subject, but will inquire if the hon. Member so desires.

TUESDAY, NOV. 11TH.

Irish Hospitals Sweepstake.

Sir WILLIAM DAVISON asked the Chancellor of the Exchequer whether his attention had been called to the sums of money leaving this country for investment in the Irish Free State sweepstake; and whether he had in contemplation the issue of premium bonds or other similar device to secure the retention of such moneys in this country.—Mr. PETHICK-LAWRENCE (Financial Secretary to the Treasury) replied: The answer to both parts of the question is in the negative.

Sir WILLIAM DAVISON asked if the hon. gentleman was aware that hundreds of thousands of pounds were leaving this country for the Irish Free State in this connexion, that a much larger sweepstake was contemplated, and if he would not do something to meet the sporting instincts of the country in the way of premium bonds which would be both an investment and a lottery.

MEDICINE AND THE LAW.

Revivalism and Orthopædics.

THE possibility of unfortunate results following a faith-healing campaign was considered by the Stoke-on-Trent City Council at the end of last month. Many thousands of people in the potteries district are said to have been drawn to revivalist meetings conducted locally by Pastor Edward Jeffreys, a Welsh evangelist. At these meetings, it has been stated, crippled children for whose treatment the city corporation is responsible have been dealt with in a manner likely to retard their recovery. It was alleged, for example, that three child patients undergoing treatment for tuberculous disease of the spine were taken out of the frames on which they had been fixed. A boy suffering from shortening of the leg, who had been fitted at the hospital with a raised boot and calliper to prevent spinal distortion, had the calliper removed. Allegations of this nature were set out in a letter addressed to the medical officer of health (Dr. A. Wotherspoon) by Mr. W. Mitchell Smith, orthopædic surgeon to the North Staffordshire Cripples' Hospital. The letter was brought to the notice of the health committee of the council. After further consideration of the matter by the general purposes committee, the town clerk was instructed to inform Pastor Jeffreys that, while the corporation had no desire to interfere with his meetings, an undertaking would be required of him that he would not so deal in future with the children for whom the corporation was responsible. Pastor Jeffreys, on the other hand, is reported to have denied that any splints or irons have been removed by him from anyone attending his revival meetings; he claims that no one has left his meetings in any worse condition than that in which they came. He is said to have asserted in the course of an address "We say that the people are healed through Jesus Christ and the doctors don't like it," and to have claimed that there have been outstanding cases of healing which no doctor can dispute.

The City Council seems to be on firm ground in interfering on behalf of the children entrusted to its care. The case of adults, who are free to adopt any treatment they wish, is different. Those who have experience on the one hand of the remarkable results of faith healing, and on the other hand of the inevitable disappointments, will know that the warnings of the medical profession are not to be dismissed as the mere outcome of religious scepticism and professional prejudice.

MEDICAL NEWS

University of London.

Prof. G. E. Gask, director of the surgical unit at St. Bartholomew's Hospital, has been elected Dean of the Faculty of Medicine for 1930–32.

As a result of the M.D. examination in July the University medal in medicine has been awarded to Thomas Anwyl Davies, of St. Thomas's Hospital, and in pathology to Dorothy Stuart Russell, of the London Hospital.

C. L. Oakley, M.B., has been appointed Graham Scholar in Pathology at University College Hospital for two years.

Application is invited for the Geoffrey Duveen travelling studentship in oto-rhino-laryngology, of the value of £450. Candidates must be medical graduates of the University, and should apply in prescribed form to the Academic Registrar before Dec. 31st.

The Nathaniel Rogers prize for 1931, valued at £100, is offered to registered medical practitioners for an essay on Filtrable Viruses as a Cause of Disease in Man. Particulars are obtainable from the Academic Registrar.

Five lectures on Diseases of Bacteria will be given by Dr. F. W. Twort, F.R.S., superintendent of the Brown Animal Sanatory Institution, in the theatre of the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C., at 4 P.M., on Dec. 1st, 3rd, 5th, 8th, and 10th.

Medico-Chirurgical Society of Edinburgh.

The following are the office-bearers for 1929–30:—President: Prof. G. Lovell Gulland. Vice-Presidents: Mr. J. W. Dowden, Dr. E. F. Armour, and Dr. John Bowie. Councillors: Dr. C. W. Somerville, Dr. W. Fordyce, Dr. H. G. Langwill, Dr. Alex. Goodall, Dr. F. K. Kerr, Dr. Norman Carmichael, Dr. H. Maitland Moir, and Mr. A. Pirie Watson. Treasurer: Dr. John Orr. Secretaries: Dr. H. L. Watson Wemyss and Mr. F. E. Jardine. Editor of Transactions: Dr. Fergus Hewat.

Royal College of Physicians of Edinburgh.

A quarterly meeting of the College was held on Nov. 4th with Sir Norman Walker, the President, in the chair. Dr. Henry Leonard Wallace (Edinburgh) and Dr. William Brown (Aberdeen) were introduced and took their seats as Fellows. Dr. Earle Macbeth Watson (Ontario), Dr. William Archibald Hain (Bournemouth), Dr. Agnes Rose Macgregor (Edinburgh), and Dr. James Davidson (Edinburgh) were elected to the Fellowship. The Hill Pattison-Struthers bursary in anatomy and physiology was awarded to Maurice Goldfar, and the Hill Pattison-Struthers bursary in clinical medicine to Robert Leitch Allan.

Royal Faculty of Physicians and Surgeons of Glasgow.

The following will be the office-bearers for the coming year:—President: Dr. John F. Fergus. Visitor: Mr. R. Barclay Ness. Treasurer: Dr. J. H. MacDonald. Librarian: Dr. E. H. L. Oliphant. Councillors: Mr. G. H. Edington (representative of the Faculty on the General Medical Council), Dr. Andrew Alison, Dr. R. M. Buchanan, Mr. J. G. Connal, Dr. Carstairs Douglas, Dr. John Gracie, Dr. John Henderson, Mr. W. D. Macfarlane, Dr. Souttar McKendrick, Mr. Ferguson Mackenzie, and Prof. Archibald Young.

Socialist Medical Association.

At a recent meeting it was decided to form an organisation with this title. The following officers and committee were elected:—President: Mr. Somerville Hastings, M.S., M.P. Trustees: Dr. Hector Munro and Dr. V. H. Rutherford. Treasurer: Dr. Alfred Welply. Secretary: Dr. C. W. Brook. Executive Committee: Dr. Alfred Salter, M.P., Dr. R. Forgan, M.P., Miss Esther Rickards, M.S., L.C.C., Dr. Caroline Maule, Dr. Frank Bushnell, Dr. S. W. Jeger, Dr. A. V. R. Menon, Dr. J. Grant Morrin, Dr. J. Powell-Evans, and Dr. M. Rose.

Finances of University College Hospital.

On Thursday last week Prince George presided at a dinner at the Mansion House in aid of the funds of this hospital, when the amount collected, including the result of the dinner appeal, was £6500. It was stated that in the last ten years the number of beds had increased from 322 to 540, which had swollen the annual expenditure by £16,000. In the current year the expenditure will be £112,000, of which £12,000 will have to be provided by further voluntary contributions.

University of Aberdeen.

Sir Arthur Keith, conservator of the museum of the Royal College of Surgeons of England, has been elected Rector of the University of Aberdeen. Sir Arthur stood as an independent candidate and defeated Mr. John Buchan, M.P., who was nominated as a Conservative.

Society of Apothecaries of London.

Lieut.-Colonel C. T. Samman, the Master of the Society, will preside at a dinner to be held on Tuesday next, Nov. 18th, when the honorary freedom of the Society will be conferred on Mr. Arthur Greenwood, Minister of Health. The gold medal for pharmacy will be awarded to Prof. Ernest Fourneau, of the Pasteur Institute, Paris.

Extension of Edinburgh Infirmary.

An appeal is being made for £500,000 for the extension of this great hospital. The principal objects of the enlargement are the reduction of the waiting lists of between 2000 and 3000 names, mostly of persons needing surgical treatment, the provision of a combined obstetrical and gynæcological hospital of 240 beds, and a nurses' home.

An Association of Hospital Contributory Schemes.

At a conference of representatives of hospital contributory schemes at Birmingham last week it was decided to establish an association for the coördination of such efforts. Besides being a clearing-house for information, the new body will make suggestions, assist associated schemes in cases of difficulty, and be at the disposal of seekers for information when contemplating the establishment of new schemes.

A Montgomeryshire War Memorial Hospital.

A war memorial hospital for the county of Montgomery was opened last week at Llandiloes by Miss Jones, daughter of Sir Robert Jones.

South-Eastern Hospital for Children.

At the recent dinner at Merchant Taylors' Hall on behalf of this hospital £11,000 was raised.

A Railwaymen's Cot.

The Bishop of Portsmouth recently dedicated a cot in the Southern Railway Servants' Orphanage at Woking presented by the Portsmouth district committee of the institution.

Stannington Sanatorium.

A new operating theatre and X ray room have been opened at the Philipson Children's Sanatorium at Stannington, Northumberland, which contains 300 poor children.

Swindon Victoria Hospital.

Last week Lady Lansdowne opened a new wing of the Swindon and North Wilts. Victoria Hospital. Two new wards of 40 beds have been added.

Manchester Royal Infirmary Nurses' Home.

The Lord Mayor of Manchester last week opened the new nurses' home of this hospital. It will now be possible to increase the staff by 72 nurses and to establish an average working week of 56 hours. The building, which has cost £140,000, of which £60,000 remains to be raised, provides 268 bed-sitting-rooms, a number of corporate sitting-rooms, writing rooms, and a large recreation hall, the cost of which, £10,653, was raised by the nurses themselves.

"Friends of Aldershot Hospital."

Under this title an organisation has been formed for rendering personal service to Aldershot Hospital. The only financial obligation is the payment of sixpence a year, and the members register their names for sewing, mending, gardening, egg-collecting, taking patients home on discharge, and any kind of simple job for the hospital that may be required.

Enlargement of Harrow Hospital.

Miss Diana Churchill, daughter of Mr. Winston Churchill, recently opened new nurses' quarters at this hospital to which the name of Florence Nightingale has been given. Other extensive additions are in progress. An operating theatre, an X ray department, new wards for general patients, and private wards for paying patients are among these additions. The hospital is warmed by "invisible heating" which can be personally controlled to the desired temperature, and an appeal is being made for £50,000 to cover the cost of the enlargements.

Bristol Hospital Service.

The Bristol Hospitals Committee has launched an appeal for £250,000 for modernising and extending the city's hospitals. The money, which it is hoped to raise in seven years, will be used for the following purposes, the number of additional beds being stated in parenthesis: New hospital at Winford (100); reconstruction and enlargement of the Eye Hospital (50); additions to the Royal Infirmary (30); additions to the General Hospital (14); enlargement of Winford Orthopædic Hospital (60); reconstruction and additions to the Children's Hospital, including an out-patients' department and a new nurses' home; additions to the Homœopathic Hospital and enlargement of the out-patients' department.

Motor Accidents and Hospital Treatment.

The Motor Vehicles and Road Traffic Bill, which has been read a second time in the Parliament of Northern Ireland, provides that, when an insured person injured in a road accident is treated in hospital, the authorised insurer or owner will be liable for the cost of treatment up to £25.

Ashton-under-Lyne Hospital.

The governors of the Ashton-under-Lyne District Infirmary have decided, owing to the large debt, that the Summers wing—nearly half the accommodation—will have to close. The infirmary has a debt of £16,000, and they have only about £2000 to meet current liabilities of £3000.

West Ham Children's Hospital.

Mrs. Parsons, chairman of the hospitals committee of the West Ham town council, recently opened a new municipal children's hospital at Harold Wood. The buildings, which have cost £41,000, consist of four blocks, each containing two wards, with two single-bed wards for special cases. Altogether there is fresh accommodation for 116 patients.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Nov. 18th.—5.30 P.M., GENERAL MEETING OF FELLOWS. 8 P.M., PATHOLOGY.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Demonstration: Mr. Duncan C. L. Fitzwilliams (introduced by Dr. E. Graham Little): Rodent Ulcer and Lupus Vulgaris. Dr. H. Corsi: Alopecia Totalis (Cured by Ultra-violet Light). Case for Diagnosis; ? Plexiform Neuroma. Dr. M. Horan (for Dr. W. J. O'Donovan): Extensive Hairy Pigmented Nævus. Dr. H. W. Barber: Nævus Unius Lateralis; Angeioma Serpiginosum. Dr. Knowsley Sibley: Lichen Nitidus. Other cases will be shown. 8 P.M., ANNUAL DINNER OF THE SOCIETY, May Fair Hotel.

FRIDAY.—5 P.M., BALNEOLOGY AND CLIMATOLOGY. Presidential Address: Dr. F. G. Thomson: The Rôle of Hydrology in Preventive Medicine. 7.30 P.M., Annual Dinner of the Section at the Welbeck Palace Hotel. 8 P.M., OBSTETRICS AND GYNÆCOLOGY. Specimens: Mr. John H. Hannan: 1. Large Bilateral Krukenberg's Tumours of the Ovary. 2. Endothelioma of the Ovary. 3. A Peri-urethral Fibroma. 4. Dermoid Cyst of the Ovary with a Basal Celled Carcinoma in its Wall. 5. Carcinoma of the Body of the Uterus from a Young Woman. 6. Carcinoma of the Fallopian Tube (slide). 7. Primary Carcinoma of the Urethra (slide). Discussion on the Interim Report of the Departmental Committee on Maternal Mortality and Morbidity. Openers: Dr. T. Watts Eden and Dr. J. S. Fairbairn. 8.30 P.M., ELECTRO-THERAPEUTICS. (Cases at 7.30 P.M.) Dr. Justina Wilson: 1, 2, and 3. Tuberculosis Cutis. 4. Arthritis of the Shoulder Joint with Brachialgia. Treated by Diathermy. Dr. E. P. Cumberbatch: 5. Old-standing Lupus Vulgaris. Dr. C. A. Robinson: 6. Cervicitis Treatment by Diathermy. Sir Robert Stanton Woods: 7, 8, and 9. Subacute Dermatomyositis. Dr. L. D. Bailey: 10. Mal-union or Radius Treated by Diathermy. Dr. E. J. Deck: 11 and 12. Intra-pelvic Protusion of Acetabulæ.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

WEDNESDAY, Nov. 19th.—5 P.M., Prof. William Rothenstein: Painting and the Healing Art (Lloyd Roberts Lecture).

HUNTERIAN SOCIETY.

MONDAY, Nov. 17th.—9 P.M. (at The Cutlers' Hall, Warwick-lane, London). Discussion on The Place of the Doctor in Industry, when the following have promised to take part: Sir David Milne-Watson, Mr. W. A. Appleton, Prof. E. L. Collis, and Dr. Strickland Goodall.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

THURSDAY, Nov. 20th.—8.15 P.M. (at the Hospital for Tropical Diseases, Endsleigh-gardens, Gordon-street, W.C.). Demonstrations by Sir Aldo Castellani, Sir Thomas Carey Evans and Dr. G. R. Mather Cordiner, Dr. N. Hamilton Fairley, Dr. E. P. Hicks, Col. S. P. James, Dr. G. Carmichael Low, Mr. John F. Marshall, Drs. P. Manson-Bahr, W. Salisbury Sharpe, H. S. Stannus, Prof. Warrington Yorke, Dr. D. Uvedale Owen, and others. During the evening a short cinema film illustrating beri-beri will be shown; and the Manson lecture theatre, the new laboratories, operating theatre, X ray department and wards will be open for inspection.

ROYAL INSTITUTION, 21, Albemarle-street, W.
THURSDAY, Nov. 20th.—5.15 P.M., Mr. L. C. Martin, D.Sc.: Colour Vision (1).

LONDON CLINICAL SOCIETY.
TUESDAY, Nov. 18th.—8 30 P.M. (at the London Temperance Hospital), Annual General Meeting and Clinical Evening.

ROYAL MICROSCOPICAL SOCIETY, B.M.A. House, Tavistock-square, London, W.C.
WEDNESDAY, Nov. 19th.—5 P.M., Mr. R. J. Bracey, F.Inst.P.: A Universal Tube Length and Cover-glass Correcting Lens System for Use with Microscope Object-Glasses. Dr. W. E. Cooke and Mr. C. F. Hill, M.Inst.M.M.: Microscopical Studies in Pernicious Anæmia. I.—The Hæmoglobiniferous Cells.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Nov. 17th.—5 P.M., Mr. C. P. G. Wakeley: Demonstration of Specimens Illustrating the Pathological Conditions of the Spine and Spinal Cord.
FRIDAY.—5 P.M., Sir Arthur Keith: Specimens Illustrating Enlargement of the Prostate, with an Account of Our Knowledge of the Ætiology of the Condition.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Nov. 17th to SATURDAY, Nov. 22nd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, Special M.R.C.P. Lectures at 8.30 P.M., as follows: Tues., Dr. T. Izod Bennett: The Conception of Nephrosis. Fri., Dr. W. J. Adie: Diseases of the Nervous System (1). Mon., at 4 P.M., Free lecture by Mr. L. C. Rivett: Recent Advances in Gynæcology and Obstetrics.—GOLDEN-SQUARE THROAT HOSPITAL, W., Mon., Out-patient Demonstration at 2 P.M. by Mr. F. C. Ormerod. No fee for attendance.—KING'S COLLEGE HOSPITAL, Denmark-hill, S.E. Wed., Neurological demonstration in Out-patient Department at 2 P.M., by Dr. M. Critchley. No fee for attendance.—ROYAL NORTHERN HOSPITAL, Holloway-road, N. Wed. at 6 P.M., Demonstration on Gonorrhœa in the Female by Dr. Violet Russell.—Women graduates only admitted. No fee for attendance.—CITY OF LONDON HOSPITAL, Victoria Park, E. Special post-graduate course in diseases of the Heart and Lungs. All day.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Second week of special course in medicine, surgery, and gynæcology. WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Special post-graduate course in Neurology. Daily at 5 P.M.—LONDON LOCK HOSPITAL, Dean-street, W. Third week of post-graduate course in Venereal disease.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Nov. 17th.—10 A.M. to 1 P.M., Surgical Wards, Genito-Urinary Operations, Skin Department. 2 P.M., Operations, Surgical Wards, Medical, Surgical, Eye and Gynæcological Out-patients.
TUESDAY.—10 A.M. to 1 P.M., Medical Wards, Clinical Demonstration (Surgical), Dental Department. 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.
WEDNESDAY.—10 A.M. to 1 P.M., Medical and Surgical Wards, Children's Medical Out-patients. 2 P.M., Gynæcological and General Operations, Medical, Surgical, and Eye Out-patients.
THURSDAY.—10 A.M. to 1 P.M., Neurological Out-patients, Demonstration of Fractures. 2 P.M., Operations, Medical, Surgical, and Genito-Urinary Out-patients.
FRIDAY.—10 A.M. to 1 P.M., Medical Wards, Skin Department, Dental Department, Clinical Demonstration (Medical). 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.
SATURDAY.—10 A.M. to 1 P.M., Throat Operations, Bacterial Therapy Department, Medical Wards, Children's Medical and Surgical Out-patients.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Nov. 17th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

KING'S COLLEGE, Strand, W.C.
THURSDAY, Nov. 20th.—5 P.M., Mr. W. Robson, D.Sc.: Protein Metabolism (Second of four lectures.)

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark hill, S.E.
THURSDAY, Nov. 20th.—9 P.M., Dr. J. L. Livingstone Functional Disorders of the Colon.

UNIVERSITY COLLEGE, Gower-street, W.C.
MONDAY, Nov. 17th.—5 P.M., Mr. L. E. Bayliss, Ph.D.: Respiratory Functions of the Blood. (Second of four lectures.)

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Nov. 17th.—12 noon, Dr. Greenfield: Deficiency Diseases. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Alcoholism.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: Craniocerebral Topography.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Myasthenia Gravis.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M. Dr. James Collier: Acute Diseases of the Spinal Cord and Brain Stem.

BRITISH INSTITUTE OF RADIOLOGY, INCORPORATED WITH THE RONTGEN SOCIETY, 32, Welbeck-street, London, W.
THURSDAY, Nov. 20th.—8.30 P.M., Mr. G. Simon: Diathermy in Pneumonia. The place of Diathermy as a therapeutic agent in pneumonia. Detailed description of technique used and reasons for the adoption of this technique. Dr. A. Müller, Ph.D.: An X Ray Generator with a Rotating Water-Cooled Target.
FRIDAY.—2 P.M.–4 P.M., Visit to the Radiological Department of Charing Cross Hospital.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 18th.—5 P.M., Dr. H. W. Barber: Bacteriology and Mycology.
THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
THURSDAY, Nov. 20th.—5 P.M., Dr. J. A. Willett: Importance of Antenatal Care.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Nov. 19th.—4 P.M., Dr. Donald Hunter: Calcium and Phosphorus Metabolism.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Nov. 19th.—4.30 P.M., Mr. Kenneth Walker: Prostatitis and Prostatic Calculi.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Nov. 21st.—4 P.M., Mr. Nicol Rankin: Acute Affections of the Pharynx.

ROYAL NORTHERN HOSPITAL, Holloway-road, W.
TUESDAY, Nov. 18th.—3.15 P.M., Dr. Bruce Williamson: Demonstration of Ward Cases.

THE CHADWICK TRUST.
FRIDAY, Nov. 21st.—7.30 P.M. (at The Town Hall, Gateshead), Dr. Matthew Ray: Treatment of Rheumatism.

INSTITUTE OF HYGIENE, 28, Portland-place, W.
WEDNESDAY, Nov. 19th.—3.30 P.M., Dr. Doris Odlum: The Importance of a Healthy Mind.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Nov. 19th.—4 P.M., Dr. A. Massey: Prevention of Venereal Disease.
THURSDAY.—4 P.M., Dr. Maude E. Kerslake: Contraceptiv Problems of Destitute or Injured Women.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINIC.
FRIDAY, Nov. 21st.—3.30 P.M. (at the Royal Infirmary), Dr. Barnes: Syphilis of Cardiovascular System.

ST. JOHN'S HOSPITAL, Morden Hill, Lewisham.
MONDAY, Nov. 17th.—4.30 P.M., Dr. John Gibbens: Habitual Vomiting in Infants.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Nov. 18th.—4.15 P.M., Mr. D. L. Sewell: Radium and Cancer of the Larynx.
FRIDAY.—4.15 P.M., Dr. D. Stewart: The Function of the Dental Tissues.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Nov. 20th.—11 A.M., Dr. W. J. S. Reid; Clinical Demonstration. 4.15 P.M., Mr. P. G. McEvedy: Minor Surgery

Appointments

BLACKER, C. P., M.B., M.R.C.P. Lond., has been appointed General Secretary of the Eugenics Society.

BOYD, J., M.B., B.Ch. R.U.I., D.P.H., Senior Medical Officer under Medical Benefits Act for Northern Ireland.

GOODARD, C. E., M.D. Durh., L.R.C.P. Lond., M.R.C.S., Medical Officer of Health for Wembley.

KENT, M., M.B., Ch.B. Manch., Assistant School Medical Officer for Derby.

PENROSE, L. S., M.D. Camb., Research Medical Officer, jointly appointed by the Medical Research Council, the Darwin Trust, and the Royal Institution, Colchester.

WARNER, N. S. HEEGAARD, L.D.S. R.C.S. Eng., Honorary Dental Surgeon to the British Dental Hospital, London.

Certifying Surgeons under the Factory and Workshops Acts: IRVING, G., M.D., B.S. Durh. (Stockton-on-Tees), and LAFFERTY, G. P., M.B., B.Ch. N.U.I. (Castleton, Derby).

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Mental Hospital.—Jun. Asst. P. £300.

Bethnal Green Hospital, Cambridge-road, E.—Asst. M.O. £350.

Birmingham City Maternity and Child Welfare Committee.—Asst. M.O. £500.

Birmingham General Hospital.—Surg. Cas. O. £400.

Bolton Infirmary and Dispensary.—Two H.S.'s. Each £150. Also Cas. O. At rate of £150.

British Guiana.—Asst. Government M.O.H. £650.

British Hospital for Functional Mental and Nervous Disorders, 72, Camden-road, N.W.—Hon. Physician.

Bury St. Edmunds, West Suffolk General Hospital.—Jun. Res. M.O. £150.

Cairo, Egypt, Kitchener Memorial Hospital.—Sen. M.O. £400.

Cambridge, Addenbrooke's Hospital.—H.P. Also Res. Anæsthetist and Emergency Officer. Each at rate of £130.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Canterbury, Kent and Canterbury Hospital.—Hon. Surg.

Cape Town University.—Assistant Anatomist. £750.

Cardiff Royal Infirmary.—H.S. At rate of £50. Aural H.S., and Cas. Surg. O. Each at rate of £75.

Chester County Mental Hospital.—Jun. Asst. M.O. £350.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.

Connaught Hospital, Orford-road, E.—Res. H.S. At rate of £100. Also Hon. Visiting Dental Surgeon.

Elizabeth Garrett Anderson Hospital, Euston-road.—H.P., Obstet. Asst., and Three H.S.'s. Each at rate of £50.

Hackney Hospital, High-street, Homerton, E.—Deputy Med. Supt. £550.

Hendon, Colindale Hospital.—Jun. Asst. M.O. £500.

Hospital for Consumption and Diseases of Chest, Brompton, S.W.—Asst. in Dept. of Pathology. £350.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also H.S. and H.P. Each at rate of £100.

Hull Royal Infirmary.—Asst. H.P. At rate of £130.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. £120.

L.C.C.—Jun. Asst. M.O. for Mental Hospital Service. £500. Also 8th Asst. M.O. £445.

Leeds, St. James's Hospital.—H.P. and S. £200.

Leicester Royal Infirmary.—Surgical Dresser. 10s. 6d. per week.

Leyton, Borough of.—Asst. M.O. £500.

Liverpool, Royal Children's Hospital, Myrtle-street.—Res. Cas. O. £250.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. Also H.P. At rate of £120 and £100 respectively.

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.

Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £100.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.

Manchester, Ancoats Hospital.—Part-time Med. Reg. and Surg. Reg. Also H.S. All at rate of £100.

Manchester City, Abergele Sanatorium.—Med. Supt. £900.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—Med. Reg. £150. Also Res. Clin. Pathologist. £100.

Metropolitan Hospital, Kingsland-road, E.—Asst. M.O. to X Ray and Electrical Dept.

Middlesbrough Education Committee.—Asst. School M.O. £500.

National Hospital, Queen-square.—H.P. £150.

Newcastle General Hospital.—Sen. Res. M.O. £300. Also H.P. and H.S. Each at rate of £100.

Newcastle-upon-Tyne Hospital for Sick Children.—Res. H.P. At rate of £100. Res. Sen. H.S. Also Jun. H.S. Each at rate of £100.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Asst. S. to Eye Department.

New Zealand, Hawkes Bay Hospital, Napier.—Pathologist. £750.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Plymouth, South Devon and East Cornwall Hospital.—H.P. Also H.S. to Casualty and Special Dept. At rate of £120 and £100 respectively.

Preston, Biddulph Grange Orthopædic Hospital.—Sen. H.S. At rate of £250.

Prince of Wales's General Hospital, N.—Hon. Clin. Assts. to Various Departments.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, N. Kensington.—Hon. Asst. Anæsthetist and Hon. Assist. Dental Surgeon. Also H.S. At rate of £100.

Queen's Hospital for Children, Hackney-road, E.—H.P. At rate of £100.

Royal College of Surgeons of England.—Election to Court of Examiners.

Royal Free Hospital, Gray's Inn-road, W.C.—Surg. Reg. £200. Res. H.S. to Ear, Nose, and Throat Dept., Res. Cas. O. £150. Res. Anæsthetist to Gynæcological, &c., Unit. £150. Half-time Gynæcological Reg., Med. Reg., and District Obstetric Asst. Each £100. Also Res. H.S.'s, H.P.'s, Asst. Anæsthetist, &c.

Royal National Orthopædic Hospital, Great Portland-street, W.—Hon. Asst. Surg.

Royal Northern Hospital, Holloway, N.—H.S. At rate of £70. Also Two Surgeons.

Ryde, Royal Isle of Wight County Hospital.—Res. H.S. At rate of £180.

St. George's Hospital, S.E.—Sen. and Two Anæsthetists.

St. Giles Hospital, Brunswick-square, S.E.—Two Asst. M.O.'s £350.

Sheffield Royal Hospital.—Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.

Sidcup, Kent, Queen Mary's Hospital for Convalescent.—Jun. Asst. M.O. £250.

South-Western Fever Hospital, Landor-road, Stockwell, S.W.—Jun. Asst. M.O. £500.

Sunderland, Durham County and Sunderland Eye Infirmary.—H.S. £350.

Todmorden Borough.—M.O.H. and School M.O. £800.

Warwick, Hertford Hill, King Edward VII. Memorial Sanatorium.—Jun. Asst. M.O. At rate of £200.

West Bromwich and District General Hospital.—Hon. Anæsthetist. Also Hon. Asst. Ear, Nose, and Throat Dept.

West Bromwich, Hallam Hospital.—Res. H.P. £250.

West London Hospital, Hammersmith-road, W.—Hon. Reg. to Throat, Nose, and Ear Department.

Wigan, Royal Infirmary.—H.S. At rate of £150.

Willesden General Hospital, N.W.—Hon. Clin. Asst. to Surgical Out-patient Dept.

Willesden Urban District Council.—Public Vaccinator.

Willesden U.D.C., Health Department.—Dentist. £420.

Yelverton, Udal Torre Sanatorium.—Res. M.O. £450.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Silverton (Devonshire), Chichester (Sussex), Dunmow (Essex), Rayleigh (Essex), and New Tredegar (Monmouthshire).

Births, Marriages, and Deaths

BIRTHS.

BARLAS.—On Nov. 2nd, at Crescent-road, Ipswich, the wife of Major A. R. Barlas, R.A.M.C., of a son.

HAWLEY.—On Nov. 2nd, at "Hazelbeech," Eaton-road, Coventry, the wife of Arthur Thomas Hawley, M.A. Camb., F.R.C.S.E., of a son.

SANSOME.—On November 8th, at Sandwell House, West Bromwich, the wife of T. Heywood Sansome, M.B., Ch.B., of a daughter.

SMITH.—On Nov. 6th, at Haddon Lodge, Shooters Hill, S.E., the wife of C. Moore Smith, of a son.

MARRIAGES.

HARDY—MOORE.—On Nov. 7th, at Brighton, George Wilfrid Hardy, M.R.C.S. Eng., L.R.C.P. Lond., of Shoreham, to Dora, third daughter of Mr. and Mrs. Stanley Moore, of Clarendon-terrace, Brighton.

DEATHS.

DAVIES.—On Nov. 5th, after a short illness, at Templecrone, Westcombe Park-road, Blackheath, Hugh Davies, F.R.C.S. Eng., M.B., B.S., of Harley-street, and Llanerfyl, Montgomeryshire.

DAWES.—On Nov. 4th, at Glenthorne, Putney Park-avenue, S.W., Herbert Edwin Tonge Dawes, M.R.C.S., L.R.C.P., aged 49.

GRAHAM.—On Nov. 3rd, at Paignton, Simon Dickson Graham, M.B., C.M. Edin., late R.A.M.C.

HARRIS.—On Nov. 5th, very suddenly, at Queen's-road, S.E., Dr. Edwin Gabriel Harris, M.R.C.S., L.R.C.P. Lond., in his 39th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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NOTES, COMMENTS, AND ABSTRACTS

HOW TO INDEX.

AN indexer is in this respect like a butler—that the better he does his work the less he is noticed. Dr. Walsh made an index to a book of his own a few years ago and was piqued by his reviewer, who remarked "the book is furnished with a moderately good index," to have another try, when he was rewarded with getting the mark "excellent." The reviewer added parenthetically: "Excellence in indexes is not too common." Dr. Walsh, who is principal assistant in the National Physical Laboratory, has now set out the principles of indexing in a little book of 112 pages[1] which can be read with interest and appreciation by all who have suffered from slovenly and unimaginative indexing. His rules are simple and lucid, and if the writers of medical books can induce their indexers to take them to heart, their readers will be spared much heartburning. The modest price of the book places it within the reach of every indexer. Anyone who thinks that indexing is a task for babes might be asked to say what are the catchwords for the phrase "Method of grinding concave mirrors for reflecting telescopes." Dr. Walsh discards "method" as not sufficiently distinctive to be useful, and suggests himself that the phrase might be indexed under either of two nouns, a gerund, an adjective, or a participle.

EVANS'S LIST.

Messrs. Evans Sons, Lescher, and Webb, Ltd. (Liverpool and London), have brought out their annual price list in an up-to-date form. It is divided into three sections, distinguishable by the colour of the paper, the first containing pharmaceutical and biological products with a therapeutic index, the second, ampoules, capsules, pills, and tablets, and the third surgical instruments and medical sundries. In the prices current of pharmaceutical products care has been taken to mark, with a distinctive sign, articles which are covered by the Dangerous Drugs Regulations, as well as those which come within Part I. and Part II., respectively, of the Poisons Schedule. This is a very convenient arrangement. The list will be sent to any medical practitioner or student who applies to Evans's Biological Institute, Higher Runcorn, Cheshire.

UKUSIZA ABA LIMELE.

THE first-aid movement on the Witwatersrand Gold Mines has made rapid and vigorous growth and its extension to the training of natives in methods of first-aid has been one of its most useful manifestations. The more intelligent native labourers are interested in the subject for its own sake, and this interest is further encouraged by a system of bonuses and badges for those labourers, boss boys and others, who take their first-aid certificates. Inter-mine competitions are arranged and a shield is competed for annually. The excitement among the native spectators at these contests can be intense and their comments are amusing, being caustic or appreciative as the performance of a team seems to them to warrant. The late Dr. H. T. H. Butt, who was, until his recent death, a most valued and active member of the Mine Medical Officers' Association, produced a little book[2] which should be of great service to the natives and their instructors for whom it was prepared. This public being largely illiterate, the letterpress, in the Zulu, Xosa, and Sesuto languages, is reduced to a minimum, but the illustrations are so ample and clear that explanatory notes are unnecessary. It is a compilation that would be useful for a more advanced public than that for which it was intended.

[1] The Indexing of Books and Periodicals. By John W. T. Walsh, M.A., D.Sc., M.I.E.E., Hon. Secretary, International Commission on Illumination. London: Edward Arnold and Co. 1930. 6s.

[2] Ukusiza Aba limele. First Aid Illustrated. By H. T. H. Butt, M.D. Camb. Published by the Prevention of Accidents Committee of the Rand Mutual Assurance Co., Ltd., and authorised by the S.A. Red Cross Society.

SMALL-POX AND THE PUBLIC.

To the Editor of THE LANCET.

SIR,—The letter to a school-teacher from the father of an absent scholar, quoted by Dr. C. Berkeley Way in your issue for Nov. 8th, is so delightfully humorous that we ought to be grateful to Dr. Way for publishing it.

As regards Dr. Way's serious point that the public are now realising the trivial character of variola minor, and talking about "only small-pox," is it not about time that the Ministry of Health, in the interests of preventive medicine, officially sanctioned some alternative name to "small-pox" for this non-fatal, non-disfiguring, inoffensive and trifling affection, and reserved the name "small-pox" for the very serious and fatal disease which really deserves that name?

Some day the public contempt for "small-pox" which has resulted from issuing the same name for two very different things may have disastrous consequences.

I am, Sir, yours faithfully,

C. KILLICK MILLARD.

Health Offices, Leicester, Nov. 11th, 1930.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

W. J. M. Sadler to be Surg. Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. P. B. Moroney to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: D. J. MacDougall, C. A. Slaughter, A. J. Bado, R. R. Evans, D. C. Bowie, G. W. Rose, and G. D. Gripper.

The undermentioned Majs. are restd. to the estabt.: J. W. Hyatt and T. H. Twigg.

Lt. W. F. Cooper to be Capt.

TERRITORIAL ARMY.

Capt. R. V. Powell (late R.A.M.C.) to be Capt.

Lt. H. M. Coope resigns his commn.

ROYAL AIR FORCE.

M. J. Cahalane is granted a temporary commission as a Flight Lt.

Dental Branch: F. F. Kennedy is granted a non-permanent commission as a Flying Officer.

INDIAN MEDICAL SERVICE.

Capt. (prov.) B. N. Hajra is confirmed in rank.

The undermentioned appts. are made: To be Capt. (prov.) (on prob.): Capt. Raghubansa Kishore Tandon, from I.M.S. (T.C.). To be Lts. (on prob.): Lt. Bhagwan Das Khurana, from I.M.S. (T.C.); Lt. Diwan Chand Chopra, from I.M.S. (T.C.); Lt. Jaswant Singh, from I.M.S. (T.C.); Lt. Debi Prasad Mitra, from I.M.S. (T.C.); and Jeremiah O'Neill.

COLONIAL MEDICAL SERVICES.

The following appointments have been made: Dr. B. A. Moss, Dr. L. D. Pringle, and Dr. C. E. Vardy, Medical Officers, Federated Malay States; Dr. J. A. R. Selby, Health Officer, Hong-Kong; Dr. J. Horne, Lady Medical Officer, Nigeria; Dr. M. L. Cowan, Lady Medical Officer, Straits Settlements; Dr. H. G. Calwell and Dr. G. A. Wilson, Medical Officers, Tanganyika Territory; and Dr. A. H. Mowat, Medical Officer, Uganda.

West African Medical Staff: Dr. L. W. Banks and Dr. W. E. S. Merrett, Medical Officers.

NEW BATH HOSPITAL.—On Oct. 28th the Mayor of Bath laid the foundation-stone of the new Royal United Hospital at Coombe Park, Bath, which will cost £100,000. The first portion to be built will provide 100 beds, administrative and service blocks.